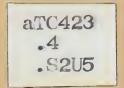
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# ST. FRANCIS RIVER BASIN REPORT

Arkansas and Missouri

# VOLUME II APPENDIX

U.S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Forest Service
Economic Reserch Service

ARKANSAS SOIL AND WATER CONSERVATION COMMISSION
MISSOURI WATER RESOURCES BOARD

Little Rock, Arkansas



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#### ARKANSAS AND MISSOURI

Volume II Appendix

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#### Prepared by

#### U.S. DEPARTMENT OF AGRICULTURE

Economic Research Service Forest Service Soil Conservation Service

In Cooperation With

ARKANSAS SOIL AND WATER CONSERVATION COMMISSION and MISSOURI WATER RESOURCES BOARD

Under Direction of
USDA FIELD ADVISORY COMMITTEE

Little Rock, Arkansas

June 1974



# 439851

# ST. FRANCIS RIVER BASIN REPORT

# ARKANSAS AND MISSOURI

Volume II Appendix

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#### ST. FRANCIS RIVER BASIN REPORT

#### ARKANSAS AND MISSOURI

#### APPENDIX

#### I. INTRODUCTION

During the planning of the St. Francis River Basin, information was obtained in much more detail than could be presented in the main report. This appendix has been added to supplement the main report and preserve this information in a readily usable form when further detailed planning is necessary.

The appendix is keyed to the main report by a system of table numbers using Roman numerals to signify the chapter and Arabic numbers running consecutively.

#### Definition of OBERS

Several years ago the program acquired the acronym of OBERS signifying a unified effort by OBE and ERS in which an integrated set of projections was developed under a common set of assumptions and procedures. Although the OBE has been renamed the BEA and will be so referred to in this report, the widespread acceptance of the term OBERS has led to its continued use as a descriptive title of the projection program.

# Acknowledgments of Data, Assistance, and Cooperation

The following individuals and groups provided important data for the report:

Agricultural Research Service

Arkansas Association of Conservation Districts

Arkansas Crop Reporting Service

Arkansas Department of Health

Arkansas Employment Security Division

Arkansas Forestry Commission

Arkansas Game and Fish Commission

Arkansas Geological Commission

Arkansas Planning Department

Arkansas Pollution Control and Department of Ecology

Arkansas Soil and Water Resources Division

Bureau of the Census

Bureau of Sport Fisheries and Wildlife

Corps of Engineers

Mississippi River Commission

National Oceanic and Atmospheric Administration

University of Arkansas Agricultural Experiment Stations and Extension Service

U. S. Department of Health, Education, and Welfare; Public Health Service; Division of Water Supply and Pollution Control

U. S. Geological Survey

Missouri Department of Conservation

Missouri State Inter-Agency Council for Outdoor Recreation

Missouri Water Resources Board

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Water Pollution Control Survey of the St. Francis River Basin, Parts 1 and 2, Arkansas Pollution Control Commission

Arkansas Conservation Districts

Phillips County Conservation District

Lee County Conservation District

St. Francis County Conservation District

Greene County Conservation District

Cross County Conservation District

Clay Conservation District

Poinsett Conservation District

Craighead Conservation District

Mississippi County Conservation District

Crittenden Conservation District

Woodruff County Soil & Water Conservation District

Missouri Conservation Districts

Ste. Genevieve County Soil & Water Conservation District St. Francois County Soil & Water Conservation District Washington County Soil & Water Conservation District Madison County Soil & Water Conservation District Cape Girardeau County Soil & Water Conservation District Wayne County Soil & Water Conservation District Reynolds County Soil & Water Conservation District Butler County Soil & Water Conservation District Bollinger County Soil & Water Conservation District Scott County Soil & Water Conservation District Stoddard County Soil & Water Conservation District Dunklin County Soil & Water Conservation District Pemiscot County Soil & Water Conservation District New Madrid County Soil & Water Conservation District

Missouri Drainage Districts by Counties Dunklin County

Varney Ridge Drainage District Elk Chute Drainage District Elk Chute and Little River Drainage District Little River Drainage District Little River Drainage District No. 19 Little River Drainage District No. 36

Drainage District No. 1

Drainage District No. 2

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Dunklin County (continued)
 Drainage District No. 4
 Drainage District No. 10
 Drainage District No. 11
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 Drainage District No. 33 - Inactive
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Scott County
 Drainage District No. 2
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 Drainage District No. 12
 Drainage District No. 14
 Drainage District No. 15
  Big Lake Drainage District
 Richland Drainage District
  Little River Drainage District
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Pemiscot County
    Little River Drainage District
    Drainage District No. 3
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    Drainage District No. 7
    Drainage District No. 8
    Blackfish Drainage District
    Tri-County Drainage District
  Clay County
    St. Francis Drainage District
    Central Clay Drainage District
    Western Clay Drainage District
  Greene County
    Mud Slough Drainage District
    Eight Mile Drainage District
    St. Francis Drainage District
    Greene and Lawrence Drainage District
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Greene County (continued)
  Cache River Bayou DeView Drainage District
  Big Creek Improvement District
Cross County
  Bayou DeView Drainage District
  Drainage District No. 3
  Brushy Lake Bayou Drainage District
  Lansing Drainage District
  Tri-County Drainage District
  Drainage District No. 6
  Caney Creek Watershed Improvement District
  St. Francis Levee District
Mississippi County
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 Drainage District No. 9
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Poinsett County
  Tyronza Drainage District
  Drainage District No. 3
 Drainage District No. 4
  Drainage District No. 5
 Drainage District No. 7
 Drainage District No. 8
Craighead County
  Drainage District No. 1
  Drainage District No. 2
 Drainage District No. 3
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 Drainage District No. 10
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                                 Drainage District No. 24
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                                 Drainage District No. 26
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                                 Drainage District No. 28
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                                 Drainage District No. 29
 Drainage District No. 20
                                 Drainage District No. 30
 Drainage District No. 21
                                 Drainage District No. 32
St. Francis County
  Larkin Creek W P
  St. Francis Levee District
 New Castle Water Association Inc.
  Tri-County Drainage District
Lee County
  Black Swamp Drainage District
  Flag Lake Drainage District
 Hog Tusk Drainage District
  Greenbrier Drainage District
 Lee-Phillips & Larkin Creek Watersheds
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Appendix table I-1--Drainage areas of the subbasins St. Francis River Basin, Arkansas and Missouri

	Drainag	ge area
Subbasin	Acres	Sq. Mi.
Above Wappapello Reservoir	838,400	1,310
Main stem below Wappapello Reservoir	2,650,240	4,141
Little River System	1,313,280	2,052
L'Anguille River	600,320	938
Total	5,402,240	8,441

APPENDIX TABLES - CHAPTER II

Environmental Setting



Appendix table II-1--Soils associations and descriptions

#### MLRA 116 Missouri

The Ozark Highland consists of gently sloping to steep soils formed in weathered cherty and clayey limestones, calcareous clays and sandstone residuum. Bottom-land soils formed in local alluvium occur in narrow valleys.

- 1. <u>Clarksville-Doniphan-Lebanon Association</u> Steep to gently sloping, somewhat excessive to moderately well drained soils formed wholly or partially in cherty limestone residuum on dissected uplands.
- 2. Crider-Hagerstown-Bardley Association Gently sloping to strongly sloping, well drained soils formed wholly or partially in clayey residuum weathered from dolomite or limestone on the uplands.
- 3. <u>Tilsit-Hector Association</u> Steep to gently sloping, moderately well and well drained soils formed wholly or partially in sandstone residuum on the uplands.
- 4. Midco-Gladden-Sharen Association Nearly level to moderately sloping, somewhat excessive and well drained soils formed in alluvium.
- 5. Unnamed Soils Association Very steep to gently sloping, somewhat excessive to moderately well drained soils formed wholly or partially in igneous rock residuum.
- 6. <u>Doniphan-Union Association</u> Steep to gently sloping well and moderately well drained soils formed in cherty limestone and loess on the eastern Ozark border uplands.

#### MLRA 131 Arkansas and Missouri

The Southern Mississippi Valley Alluvium consists of soils formed in clayey to sandy alluvium on flood plains and natural levees along the Mississippi River and its tributaries.

- 10. Gideon-Wardell-Lilbourn Association Nearly level, poorly and somewhat poorly drained soils formed in loamy alluvium.
- 11. Bosket-Broseley Association Nearly level and gently undulating, well drained soils formed in loamy and sandy alluvium.
- 12. Sharkey Association Level, poorly drained soils formed in clayey alluvium.
- 13. <u>Dundee Association</u> Nearly level, somewhat poorly drained soils formed in loamy alluvium.
- 14. <u>Bosket-Beulah-Broseley Association</u> Nearly level and gently sloping, well and somewhat excessively drained soils formed in loamy and sandy alluvium.

- 15. Commerce-Crevasse-Caruthersville Association Nearly level and gently undulating, somewhat poorly to excessively drained soils formed in loamy and sandy alluvium.
- 16. Hayti-Portageville-Cooter Association Level and gently undulating, very poorly to moderately well drained soils formed in clayey alluvium.
- 17. <u>Lilbourn-Crevasse-Canalou Association</u> Level and gently undulating, somewhat poorly to excessively drained soils formed in loamy and sandy alluvium.
- 18. Gideon-Roellen-Sikeston Association Level to nearly level, poorly drained, soils formed in loamy and clayey alluvium.
- 19. Amagon-Fountain-Beulah Association Level and gently undulating, poorly and somewhat excessively drained soils formed in loamy alluvium.
- 22. <u>Dubbs-Bosket-Beulah Association</u> Level and gently undulating, well and somewhat excessively drained soils formed in loamy alluvium.
- 23. Commerce-Robinsonville-Convent Association Level and gently undulating, somewhat poorly and well drained soils formed in loamy alluvium.
- 24. Sharkey-Tunica Association Level and gently undulating, poorly drained soils formed in clayey and loamy alluvium.
- 25. Sharkey-Steele Association Level, poorly drained, moderately well drained soils formed in clayey and loamy alluvium.
- 26. Amagon-Dundee-Crevasse Association Level and gently undulating, poorly to excessively drained soils formed in loamy and sandy alluvium.
- 27. Dundee-Dubbs Association Level and gently undulating, somewhat poorly and well drained soils formed in loamy alluvium.
- 30. Alligator-Earle-Sharkey Association Level and gently undulating, poorly and somewhat poorly drained, acid and nonacid soils formed in clayey and loamy alluvium.
- 32. Mhoon-Dundee Association Level, poorly drained and somewhat poorly drained soils formed in loamy alluvium.
- 33. Alligator-Sharkey Association Level and gently undulating, poorly drained soils formed in clayey alluvium.
- 36. Newellton-Sharkey-Tunica Association Level and gently undulating, poorly and somewhat poorly drained, nonacid soils formed in clayey and loamy alluvium.

- 38. Mantachie-Iuka-Ochlockonee Association Level and undulating, somewhat poorly and well drained soils formed in loamy alluvium.
- 39. Alligator-Earle Association Level and gently undulating, poorly and somewhat poorly drained acid soils formed in clayey and loamy alluvium.

#### MIRA 134 Arkansas and Missouri

The Southern Mississippi Valley silty upland consists of loamy soils formed in thick loess on gently sloping to steep uplands and low broad flats. Alluvial soils on flood plains and low terraces formed in silty sediments washed from the loess uplands are also included in this region.

- 7. Falaya-Collins Association Level to nearly level, somewhat poorly and moderately well drained soils formed in alluvium on flood plains.
- 8. <u>Calhoun-Wrightsville Association</u> Level, poorly drained soils formed in loess capped alluvium on low terraces.
- 9. Loring-Memphis Association (Missouri) Gently sloping to steep, well and moderately well drained soils formed in thick loess on uplands.
- 20. <u>Loring-Memphis Association</u> (Arkansas) Gently sloping to steep, moderately well and well drained soils formed in thick loess on uplands.
- 21. Calhoun-Calloway-Fountain Association Level and nearly level, poorly and somewhat poorly drained soils formed in thick loess on broad flats.
- 28. <u>Henry-Calhoun-Calloway Association</u> Level and nearly level, poorly and somewhat poorly drained soils formed in thick loess on broad flats.
- 29. <u>Hillemann-Henry Association</u> Level and nearly level, somewhat poorly and poorly drained loamy soils formed in thick loess on broad flats.
- 31. Arkabutla-Collins Association Level, somewhat poorly and moderately well drained soils formed in loamy alluvium on flood plains.
- 34. Calloway-Loring-Henry Association Level and nearly level, poorly to moderately well drained, loamy soils formed in thick loess on broad flats and narrow ridges.
- 35. Zachary-Tichnor Association Level, poorly drained, soils that were formed in loamy alluvium on flood plains.

- 37. Memphis-Natchez Association Nearly level to steep, well drained loamy soils formed in thick loess on the uplands.
- 40. Loring-Memphis-Grenada Association Nearly level to steep, moderately well and well drained, loamy soils formed in thick loess on the uplands.
- 41. Calloway-Henry Association Level and nearly level, poorly and somewhat poorly drained, loamy soils formed in thick loess on broad flats.

Appendix table II-la--Descriptions of soil productivity groups

#### Missouri:

#### SPG 1. MLRA's 131 and 134

Deep, well drained, medium textured soils developed in loess and alluvium. They have high available moisture capacity. Slopes are level to about 20 percent. Erosion is slight to severe. Capability classes are I, II, IV, and VI. Major soil series are Memphis, Loring Caruthersville, Dubbs, and Bosket.

# SPG 2. MLRA's 131 and 134

These are moderately deep soils underlain by gravel or sand and some have a fragipan. They developed in alluvium, or loess over coastal plains gravel and sand. They are on level to 9 percent slopes and have medium to low available moisture. Erosion is slight to severe. Capability classes are II, III, and IV. Soils include small gravelly bottoms like the Elash and Gladden series and the upland Lax and Providence series.

#### SPG 3. MLRA 134

This group consists of moderately well drained soils developed in loess on Crowley's Ridge and moderately well and somewhat poorly drained soils developed in alluvium on gently sloping bottoms. The silt loam surface is underlain by a silt loam or light silty clay loam subsoil. The available moisture capacity is generally high on uneroded soils and medium on eroded soils. They occupy slopes ranging from 2 to 13 percent. There is slight and moderate and in some places severe erosion. The capability classes are II, III, and IV. The upland part is mostly Grenada soils and the gently sloping bottoms are occupied by Falaya and Collins.

#### SPG 4. MLRA 131

Deep, somewhat poorly and poorly drained soils on level or nearly level bottomlands of the Mississippi River Delta. These soils are developed in coarse-silty, fine loamy and fine silty textured alluvium. They all have high available moisture. Since they occupy level areas, erosion is not a problem. Moderate to severe wetness is a problem. Capability classes are II and III. The soils include the Falaya, Commerce, Dundee, Waverly, Mhoon, Hayti, Sikeston, and Gideon series.

#### SPG 5. MLRA 131

These are mostly deep, poorly and somewhat poorly drained soils with silt loam surface layers over silty clay loam, clay loam, or clay subsoils. Some, however, have silt loam or sandy loam textures. The available moisture capacity is medium. Slopes are level to about 10 percent. There is a moderate to severe wetness problem on level areas and a severe erosion hazard on the slopes. Capability classes are II, III, IV, and VI. The major soils are Calhoun, Amagon, Wardell,

Forestdale, Zachery, Calloway, and Patterson.

#### SPG 6. MLRA 131

These are poorly drained, fine textured soils developed in clayey sediments deposited by still water on backswamp areas. They are level to slightly depressional. The clayey surface is underlain by dark or gray clay to depths of 3 feet or more except for the Tunica series which is underlain by loamy sediments between 24 and 36 inches. The soils have low available moisture capacity. Wetness is a severe problem because of overflow, slow runoff, high water table, and slow internal drainage. Capability classes are II and III. Major soils are Sharkey, Alligator, Iberia, and Tunica.

#### SPG 7. MLRA 131

These are deep, well to excessively drained, rapidly permeable soils developed in sandy alluvium. They contain low and very low available moisture. They are on nearly level to undulating areas of the Mississippi River Delta. These soils have a droughty problem and undulating areas are especially subject to blowing. Capability classes are III and IV. Soil series include Crevasse, Canalou, Bruno, and Steele.

#### SPG 8. MLRA 131

This group contains those unidentified soils heretofore referred to as organic soils. The major area of this occurrence is in the extreme northern part of LRA 131. These soils are poorly drained, dark colored, wet soils developed mostly from organic materials under wet swampy conditions. It is mostly capability class III. Soils unknown.

#### SPG 9. MLRA 134

This unit consists of steep slopes occupied by well and moderately well drained soils developed in loess, coastal plains gravel and cherty limestone residuum. They range from deep to shallow, high to low available moisture capacity and from 15 to about 35 percent slope. Erosion is a severe hazard. The shallow soils and the gravelly soils are droughty. Capability classes are VI and VII land. The major soils are of the Loring, Memphis, Saffell, Grenanda, and Clarksville series.

#### SPG 10. MLRA's 115 and 116

All this group consists of deep, well and moderately well drained soils of the uplands and bottoms. The silt loam surface is over silt loam, silty clay loam, or clayey textured subsoils. These soils are developed in loess, limestone residuum, and alluvium on nearly level to steep slopes. The nearly level areas have no major problems while the sloping part is subject to erosion. They contain mostly high available moisture. Capability classes are I, II, III, and IV. The soil series include the Ashton, Nolin, and Sharen of the bottomland, and the Crider, Hagerstown, Memfro, and Winfield of the uplands.

#### SPG 11. MLRA 115 and 116

This group contains mostly moderately deep soils on stream bottoms and uplands underlain by gravel, chert, or fragipans. The soils are somewhat excessively drained, well drained, and moderately well drained. They contain medium and low available water. They occupy nearly level to moderate slopes. Droughtiness is common to the soils and in addition the sloping areas are subject to moderate to very severe erosion. Mainly capability classes II, III, and IV. The major soils are of the Elash, Gladden, and Razort series of the small stream bottoms and the Lebanon and Plato series of the uplands.

# SPG 12. MLRA 115 (Possibly a small amount in 116).

This group is composed of moderately well drained soils developed in 2 to 4 feet of loess over cherty limestone or sandstone residuum. A moderately to strongly developed fragipan occurs at 30 to 40 inches depth in uneroded profiles. These soils occupy upland and low slope positions of 2 to 13 percent slope. The available moisture capacity is medium. There is a moderate to very severe erosion hazard. Capability classes include II, III, and IV. The major soil series are Union, Tilsit, and some acreage of Viraton.

## SPG 13. MLRA's 115 and 116

This group is made up of deep somewhat poorly and poorly drained soils of the level or nearly level stream bottoms. They have silt loam and silty clay loam textures throughout. They have a moderate to severe wetness problem due to overflow, slow runoff, and high water table. The available moisture capacity is generally high. Capability classes are II and III. Soils include the Belknap, Newark, Westerville, Melvin, Dockery, and Bonnie series.

# SPG 14. MLRA's 115 and 116 (mostly 115)

Deep, somewhat poorly and poorly drained soils of the uplands and second bottoms (terraces) make up this group. The silty surface is over a silty, clayey loam, or clayey subsoil. They are developed in loess and alluvium and nearly level to gentle slopes. The available moisture capacity is medium. Nearly level areas have a wetness problem and sloping fields have a moderate to severe erosion hazard. The capability classes are III and IV. The soils are Auxvassa, Freeburg, Marion, Moniteau, and Weldon.

### SPG 15. MLRA 116

This group consists primarily of shallow and cherty, moderately well to somewhat excessively drained soils of the Ozark highlands. Most of the acreage is gentle to sloping ridge tops and gently sloping narrow stream bottoms. They contain low available moisture. Although the soils are droughty, the major problem is considered to be its susceptibility to erosion. Capability classes are III and IV. Soils include Clarksville, Coulstone, Nixa, Elash, and Razort.

### SPG 16. MIRA 115 and 116

Soils of this group are shallow, cherty, and stony. They range from moderately well to somewhat excessively drained soils, mostly on steep slopes. A small acreage is gravel beds along the channel of the larger streams. All these soils generally contain only very low available moisture. All the soils are droughty but at the same time are subject to severe erosion because of the steep slope which they occupy. However, the shallow soils are considered to have a dominant limitation of droughtiness and the deeper cherty and stony soils have a dominant hazard of erosion. They are capability classes IV, VI, and VII. The major soil series are Gasconade, Hector, Clarksville, Coulstone, Doniphan, Ashe, and Lebanon. Included are the land types: Rockland and Riverwash.

#### Arkansas:

### SPG 17. MLRA 134

Capability classes II, III, and IV. Soil groups 5, 65, and M56. Deep, moderately well drained and somewhat poorly drained soils. Silt loam over very slowly permeable clay subsoil. Slow to medium runoff. Moderate available moisture capacity. Moderately erosive. Mostly Stuttgart and Hillemann soils on gentle slopes.

### SPG 18. MLRA 134

Capability classes I, II, III, and IV. Mostly soil groups 67, 6p, and 67L. Deep, moderately well drained and well drained loess soils. Brown silt loam over moderately permeable, to slowly permeable, silty clay loam subsoil. Some have a pan layer in the subsoil. Moderate available moisture capacity. Very erosive soils. Slopes 0 to 12 percent. Major soils are Memphis, Loring, and Grenada.

# SPG 19. MLRA 134

Capability classes VI and VII. Soil groups 67L and 7vd. Deep, well drained loess soils. Brown silt loam over moderately permeable, crumbly, silty clay loam subsoil. Some areas are gravelly. Moderate available moisture capacity. Very erosive soils. Slopes 12 to more than 20 percent. Major soils are Memphis, Loring, and Brandon.

# SPG 20. MLRA 134

Capability classes I and II. Soil group 89. Deep, well drained bottom-land soils. Friable, silt loam surface over moderately permeable, crumbly, silt loam subsoil. Moderately high available moisture capacity. Slight to moderate overflow hazard. Slopes 0 to 3 percent. Mostly Collins soils.

# SPG 21. MIRA 134

Capability classes II, III, and IV. Soil groups la, 5al, 5alL, 6al, 6alL, and 65a. Deep, somewhat poorly and poorly drained soils. Grayish, friable, silt loam over grayish, slowly permeable, compact silty clay loam or silty clay subsoil. Moderate available moisture capacity. Seasonal water table near surface. Principal soils are Crowley, Calhoun, Henry, and Calloway.

### SPG 22. MLRA 134

Capability classes II, III, and Vw. Soil groups 3a, 8a, 8al, I8a, and 89. Deep, poorly drained or overflowed bottom land. Gray loams and clays over mottled silt loam, silty clay loam to clay subsoil. Seasonal high water table. Slight to severe overflow hazard. Principal soils are Arkabutta, Waverly, Tichnor, and Zachary.

### SFG 23. MLRA 131

Capability classes I, II, and III. Soil groups 4 and 89. Deep, moderately well drained and well drained bottom-land soils. Crumbly clay to silty clay loam and friable loam over slowly to moderately permeable clay, sandy clay loam, silty clay loam, or loam subsoil. Moderate to moderately high available moisture capacity. Slight overflow hazard; slight erosion hazard. Slopes 0 to 8 percent. Principal soils are Dundee, Bosket, and Dubbs.

# SPG 24. MLRA 131

Capability classes II, III, and V. Soil groups 3, 3a, 3z, and 4al. Deep, poorly to somewhat poorly drained bottom-land soils. Mostly gray or mottled clay to silty clay, locally over stratified sandy subsoil. Moderately high available moisture capacity. Seasonal high water table. Slight to severe overflow hazard. Principal soils are Alligator, Bowdre, Earle, Newellton, Sharkey, and Tunica.

# SPG 25. MLRA 131

Capability classes II, III, and V. Soil groups 8a, 8al, I8a, 14a, and 89. Deep, poorly drained bottom-land soils. Gray loams over moderately high available moisture capacity. Subject to moderate to severe overflow and high seasonal water table. Principal soils are Amagon, Forestdale, Mhoon, Dubbs, Commerce, and Robinsville.

# SPG 26. MIRA 131

Capability class III. Soil group 15x. Deep, excessively drained bottom-land soil. Rapidly permeable, loose, loamy sand. Low available moisture capacity. Some areas subject to overflow. Slope 0 to 3 percent. Mostly Bruno and Crevasse soils.

#### SPG 27. MLRA 134

Capability classes I, II, III, and IV. Mostly soil groups 67, 6p, and 67L. Deep, moderately well drained and well drained loess soils. Brown silt loam over moderately permeable, to slowly permeable, silty clay loam subsoil. Some have a pan layer in the subsoil. Moderate available moisture capacity. Very erosive soils. Slopes 0 to 12 percent. Major soils are Memphis, Loring, and Grenada.

### SPG 28. MLRA 134

Capability classes II, III, and IV. Soil groups la, 5al, 5alL, 5aL, 6alL, and 65a. Deep, somewhat poorly and poorly drained soils. Grayish, friable, silt loam over grayish, slowly permeable, compact silty clay loam or silty clay subsoil. Moderate available moisture capacity. Seasonal water table near surface. Principal soils are Crowley, Calhoun, Henry, and Calloway.

Appendix table II-2--Degree and kind of limitations for building sites, sewage and solid waste disposal systems St. Francis River Basin

1. Clarksville-Donithan-Lebanon	inhan-Lebanon		Carried Carried (Venezi University)	האבדדווע אינויסני מאפתופוני	Small Commercial Cultaing	LOCAL FORCE BNG Streets
	Moderate: slope (D) 6-15% Severe: slope (E&F) 15-40%	Severe: slope, permeability	Moderate: slope, 15-20% cherty material Sevare: slope 25%	Moderate: slopes 8-15%	Moderate: slopes 8-15%	Moderate: slopes 8-15% Severe: slopes 15-40%
Doniphsn	None to slight: slopes 8% or less Moderate: slopes 8-15% Severe: slopes over 15%	Moderate: slopes 2-7%, permeability Severe: slopes over 7 %	None: slopes 2-15% Slight: slopes 15-25% Severe: slopes over 25%	Moderate: slopes 8-15%, shrink-svell potential Severe: slopes over 15%	Moderate: slopes 8-15%, shrink-swell potential Severe: slopes over 15%	Moderate: slopes 8-15%, shrink-swell potential Severe: slopes over 15%
Lebanon	Severe: permeability	Moderate: slopes 2-7%, seasonally high water table Severe: slopes over 7%	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Moderate: traffic supporting capacity
2. Crider-Hagerstown-Bardley	m-Bardley					
Crider	Slight: slopes 8% or less Moderate: slopes 8-15%	Moderate: slopes 3-7% Severe: slopes over 7%	Slight: slopes 2-15%	Moderate: slopes 8-15%, shrink-swell	Moderate: slopes 8-15%, shrink-swell	Moderate: slopes 8-15%, shrink-swell
Hagerstown	Slight: slopes 3-8% Moderate: slopes 8-15%	Moderate: slopes 3-7%, permeability Severe: slopes over 7%	Slight: slopes 3-15%	Moderate: slopes 8-15%	Moderate: slopes 8-15%	Moderate: slopes 8-15%
Bardley	Severe: depth to bedrock	Severe: slopes 7-17%, depth to bedrock	Severe; depth to bedrock	Severe: shrink-swell	Severe: shrink-swell	Severe: traffic supporting capacity
3. Tilsit-Hector						
Tisit	Severe: slopes 1-8%, permeability Severe: slopes 8-15%, permeability	Slight: slopes 1-2% Moderate: slopes 2-7% Severe: slopes 7-15%		Moderate: slopes 1-6%, bearing capacity, wetness Moderate: slopes 6-15%, bearing capacity	Moderate: alopes 1-4%, bearing capacity Moderate: alopes 4-48%, bearing capacity Severe: alopes 8-15%	Moderate: slopes 1-6%, traffic supporting capacity Moderate: slopes 6-15%, traffic supporting capacity
Hector	Severe: depth to bedrock	Severe: depth to bedrock		Severe: slope and depth to bedrock	Severe: slope and depth to bedrock	Severe: slope and depth to bedrock
4. Midco-Gladden-Sharen	aren					
Midco	Severe: flooding	Severe: permeability, coarse fragments, flooding	Severe: flooding, perme- ability	Severe: flooding	Severe: flooding	Severe: flooding
Gladden	Severe: flooding	Severe: permeability, tex- ture, floods	Severe: flooding, perme- ability	Severe: flooding	Severe: flooding	Moderate: traffic sup- porting capacity, flooding
Sharen	Moderate: permeability, seasonally high water table	Moderate: permeability		Moderate: bearing capacity	Severe: flooding	Severe: traffic sup- porting capacity, flooding
:						)

Appendix table II-2 (cont.) -- Degree and kind of limitations for building sites, sevage and solid waste disposal systems
St. Francis River Rasin

Designation   Note to single: 1Joye 65   Section 1 Joye 2-76,   Enter: 1Joye 2-156   Section 1 Joye 6-156,   Section 1 Joye 1	Soil associations	Septic tank absorption field	Sevage Lagoone	Sanitary landfill (trench type)	Dwellings without basement	Small commercial building	Local roads and streets
	6. Doniphan-Union						
Delicity   Control   Con	Doniphan	None to slight: slopes 8% or less Hoderate: slopes 8-15% Severe: slopes 15% and over	Moderate: slopes 2-7%, permeability Severe: slopes 7% and over	None: alopes 2-15% Slight: alopes 15-25% Severe: alopes 25% and over	Moderate: alopes 8-15%, shrink-swell potential Sewere: alopes over 15%	Moderate: alopes 8-15%, shrink-swell potential Severe: alopes over 15%	Moderate: slopes 8-15%, shrink-swell potential Severe: slopes over 15%
Palaye   Severe seasonally high   Severe seasonally high water table. Thoching   Severe seasonally high water table   Severe seasonally high   Severe seasonally high   Severe seasonally high water table   Severe seasonally high   Severe seasonally high   Severe seasonally high   Severe seasonally high water table   Severe seasonally high water table   Severe seasonally high water table   Severe seasonally high   Severe seasonally high   Severe seasonally high   Severe seasonally high   Severe seasonally high water table   Severe seasonally high   Severe seasonally high water table   Severe seasonally high   Severe seasonally high water table   Severe seasonally high water table   Severe seasonally high   Severe seasonally high water table   Severe seasonally high   Severe seasonally high water table   Severe seasonally high   Severe seasonally high water table   Severe seasonally high water table   Severe seasonally high water table   Severe seasonally high   Severe seasonally high   Severe seasonally high   Severe seasonally high	Union	Severe: permeability	i di	-	Severe: seasonally high water table above fragipan for longer than one month	Severe: seasonally bigh water table	Moderate: shrink-swell potential
Palaya   Severe: associally high   Moderate: parson   Severe: parson   Severe: parson   Severe: parson   Severe: parson   Severe: parson   Moderate: parson   Moder	- 1						
colling water table, flooding water table, flooding server: seasonally high water table, colling server: seasonally high water table ally high water table and the seasonally high water table and the seasonally high water table water table and believe table and the seasonally high water table water table and high water table water table and high water table wat	Falaya		evere:	Severe: seasonally high water table, flooding	Severe: seasonally high water table, flooding	Severe: seasonally high water table, flooding	Severe: seasonally high water table, flooding Moderate: treffic supporting capacity
Calboun         Severe: permeability, season         Severe: seasonally high water table         Severe: permeability, season         Severe: seasonally high water table	Collins	Severe: aeasonally high water table, flooding	Moderate: permeability		Severe: sassonally bigh water table, flooding	Severe: seasonally high water table, subject to flooding	Severe: traffic supporting cepacity, seasonally high water table, flooding
calloum ally high water table table about water table about water table ally high water table allopes 2-7% severe: permeability, sees one 2.5% severe: permeability, sees one 2.5% severe: permeability, sees allopes 2-7% severe: alopes 2-1% severe: alopes 2-7% severe: alopes 2-1% severe:		il.					
Wrighteville         Severe: permeability, seeson- ally high water table         Slight         Roderate: slopes 2-7%         Roderate: slopes 2-5%, bearing capacity         Roderate: slopes 3-20%, bearing capacity         Roderate: slopes 3-20%	Calhoun			Severe: seasonally high water table	Severe: permeability, seasonally high water table	Severe: corrosivity of un- coated steel, seasonally high water table	Severe: seasonally high water table
Severe: permeability   Moderate: alopes 2-7%   Moderate: slopes 2-6%, bearing capacity   Moderate: slopes 2-6%, bearing capacity   Moderate: slopes 6-15%   Moderate: slopes 6-10%   Moderate: slo	Wrightsville		Slight		Severe: wetness, shrink- swell potential	Severe: wetness, shrink- swell potential, corrosiv- ity of uncoated steel	Severe: wetness, shrink- swell potential, traffic supporting capacity
Severe: permeability   Roderate: alopes 2-7%   Roderate: alopes 2-6%,   Roderate: alopes 2-8%,   Roderate: alopes 2-2%   Roderate: alopes 2-2%   Roderate: alopes 3-20%	- 1						
Nemphils         Signt: slopes 0-5%         Moderate: slopes 0-7%         Moderate: slopes 0-1%         Moderate: s	Loring	Severe: permeability	Moderate: slopes 2-7% Severe: slopes 7-20%		Moderate: slopes 2-6%, bearing capacity Moderate: alopes 6-15%, bearing capacity Severe: alopes 15-20%	Hoderate: slopes 2-8%, bearing capacity Severe: slopes 8-20%	Moderate: slopes 2-12%, traffic supporting capacity Severe: slopes 15-20%
Gideon Gevere: permeability, sea- Severe: seasonally high Severe: seasonally high severe: seasonally high water table severe: seasonally high water table severe: seasonally high water table severe: seasonally high severe: seasonally high severe: seasonally high water table water table water table severe: seasonally high seasonally high seasonally high severe: seasonally high severe: seasonally high severe: seasonally high severe: seasonally high seasonally high seasonally high seasonally high severe: seasonally high seasonally seasonally high seasonally seasonally high seasonally		Slight: slopes 0-5% Moderate: slopes 5-10% Severe: slopes 10-40%			Moderate: slopes 0-15%, bearing capacity Severe: slopes 15-40%	Moderate: slopes 0-8%, bearing capacity Severe: slopes 8-40%	Moderate: 0-8%, traffic eupporting capacity Severe: alopes 8-40%
Severe: permeability, sea- sonally high water table sonally high water table severe: permeability, sea- severe: seasonally high water table severe: seasonally high							
Severe: permeability, sea- Severe: seasonally high water table water table water table water table water table high shrink- seell seell	Gideon	Severe: permeability, seasonally high water table		Severe: ssasonally high water table, poorly drained	Severe: seasonally high water table	Severe: seasonally high water teblo	Severe: seasonally high water teble
	Wardell	Severe: permeability, sea- sonally high water table	Severe: seasonally high water table		Severe: seasonally high water table, bigb shrink-swell	Severe: seasonally high water table, high shrink- swell	Severe: high shrink-swe potential, traffic supporting cepecity

Appendix teble II-2 (cont.)--begree and kind of limitations for building sites, sewage and solid waste disposal systems St. Francis River Basin

Boate   Coff. practity   Coff. practity	Soil associations	Septic tank absorption field	Serage lagoons	Sanitary landfill (trench type)	Dwellings without basement	Small commercial building	Local roads and streets
personality comes control in cont	11. Bosket-Broseley						
State   Stat	Bosket	Slight to moderate: slopes 0-5%, permebblity Noderate: slopes 5-7% Severe: if flooded	Moderate: alopes 0-7%, permeability Severe: alopes 7-8%		Slight: slopes 0-6%, flooding Moderate: alopes 6-9% Severe: if flooded	Slight: slopes 0-4% Woderate: slopes 0-8% Severe: if flooded	
Survey Server: seasonally high water table, footing on flooding on	Broseley:	Slight: slopes 0-8% Woderate: slopes 8-12%	Severe: alopes 0-7%, seepage seepage seepage	Severe: permeability	Slight: slopes 0-8% Moderats: slopes 8-12%	Slight: slopes 0-4% Moderate: slopes 4-8% Severe: slopes 8-4%	
Suntey Greet, permethalisty, see- Thocking on flooded phases Thocking on fl	2. Sherkey						
Dundee Server: permeability, ease somethy high water table seasonally high water table sevens seasonally high water table seasonally high sevens seasonally high water table seasonally high sevens seasonal	Sharkey	Severe: permeability, seasonally high water table, flooding on flooded phases		Severe: texture, sesson- ally high water table, flooding on flooded phases	Severe: seasonally high water table, shrink-swell potential, texture, flooded phases Very severe: flooding	Severe: seasonally high water table, shrink-swell potential, texture, flooded phases Very severe: flooding	Severe: shrink-svell potential, terture, flooding on flooded phases, sessonally high water table
Dundee Sever: permeability, sea- seasonally high water table  Boaket-Benlah-Broseley  Boaket Sellah Stock See Boaket listed under No. 11)  Boaket Sellah Stight: aloges 6-35 Severe: permeability  Broseley (See Broseley listed under No. 11)  Commerce Crevaser-Carutherwiller  Savere: Dermeability some Severe: Clocking arreas, seasonally high water table seasonally high water table  Savere: Severe: permeability some Severe: permeability Stight some areas analysed to flooding on some association of the seasonally high water table water table forcate: seasonally high water table water water water table water	3. Dundee						
Dosket Select Enclain Firoseley (See Bosket Listed under No. 11)  Brossley (See Encetey listed under No. 11)  Brossley (See Encetey listed under No. 11)  Commerce Crevasse-Carutherville Referet to flooding, areas, seasonally high water table seasonally high water table seasonally high water table Server: if subject to flooding Crevasse Slight Server: if subject to flooding Crevasse Stight Server: if subject to flooding Crevasse Stight Server: if subject to flooding Crevasse Stight Moderate: seasonally high water table Ceruthersville Moderate: seasonally high water table water table Server: if subject to flooding Crevasse Stight Moderate: seasonally high water table wate	Dundee	Severe: permeability, seasonally high water table	Severe: seasonally high water table	Severe: sessonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Moderate: traffic sup- porting capacity, seesonally high water table
See Boaket listed under No. 11)   Bealah   Slight: slopes 0-5%   Severe: permeability   Rederate: bearing capacity   Rederate: bea		oseley					
Hooseley (See Broseley listed under Mo. 11)  Commerce Severe: permeability, same areas subject to flooding on same subject to flooding seasonally high water table (Severe: seasonally high seasonally high seasonally high water table (Severe: seasonally high seas	Bosket	(See Bosket listed under No. 1	1)				
Brossley   (See Brossley listed under No. 11)	Beulah	Slight: slopes 0-5% Moderate: slopes 5-8%	Severe: permeability		Moderate: bearing capacity	Moderate: bearing capacity	Slight to moderate: traffic supporting capacity
Commerce Severe: permeability, some Severe: seasonally high water table areas antight to flooding, areas, seasonally high water table areas antight seasonally high water table areas subject to flooding areas subject to flooding areas seasonally high water table areas subject to flooding seasonally high water table severe: where subject to flooding severe: if subject to flooding flooding flooding flooding flooding seasonally high water table seasonally high water table water table flooding seasonally high water table water table flooding severe: seasonally high water table water table flooding severe: seasonally high severe: seasonally hi	Broseley	(See Broseley listed under No.	11)				
Severe: permeability, some areas subject to flooding, areas, seasonally high water table areas subject to flooding, water table areas subject to flooding twater table areas seasonally high water table areas subject to flooding seasonally high water table areas seasonally high areas seasonally high water table areas seasonally high areas	- 1	e-Caruthersville					
Slight Severe: permeability Slight Severe: if subject to Severe: seasonally high Moderate: seasona	Comerce	Severe: permeability, some areas subject to flooding, seasonally high water table	Severe: flooding on some areas, seasonally high water table	Severe: seasonally high water table, some areas subject to flooding	Moderate: seasonally high water table Severe: where subject to flooding	Moderate: seesonally high water table, corrosivity of uncoated steel Severe: if subject to flooding	Moderate: seasonally high water teble, traffic supporting capacity Severe: if subject to flooding
Moderate: seasonally high Moderate: permeability Severe: seasonally high Moderate: seasonally high water table water table water table water table	Crevasse	Slight Sewere: if subject to flooding	Severe: permeability	Slight Severe: if subject to flooding	Slight Severe: if subject to flooding	Slight Severs: if subject to flooding	Slight Severe: if subject to flooding
	Ceruthersville	Moderate: seasonally high water table	Moderate: permeability	Severe: seasonally high water table, flooding	Moderate: seasonally high water table	Moderate: seasonally high water table	Moderate: seasonally high water teble, traffic supporting capacity

Appendix table II-2 (cont.) -- Degree and kind of limitations for building sites, sewage and colid waste disposal systems
St. Francis River Basin

Soil associations	Septic tank absorption field	Sewage lagoons	Sanitary landfill (trench type)	Dwellings without basement	Small commercial building	Local roads and streets
16. Herti-Portageville-Cooter	Le-Cooter					
Hayti	Severe: flooding, perme- ability, seasonally high water table	Slight: if protected Severe: flooding	Severe: flooding, season- ally high water table	Severe: flooding, shrink- svell, seasonally high water table	Severe: flooding, shrink- swell potential, season- ally high water table	Severe: flooding, traffic supporting capacity, saasonally high water table
Portageville	Severe: permeability, seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table, shrink-swell potential	Severe: seasonally high water table, shrink-swell potential	Severe: shrink-swell potential, traffic supporting capacity
Cooter	Severe: permeability, seasonally high water table	Severe: permeability	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seesonally high water table	Slight: shrink-swell potentiel
17. Lilbourn-Crevasse-Canalou	e-Canalou					
Libourn	Severe: permeability, eca- sonally high water table	Severe: permeability, seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Moderate: sessonally high water table
Canalou			DATA NOT AVAILABLE			
Crevasse	(See Crevasse listed in No. 15)					
18. Gideon-Roellen-Sikeston	ikeston					
Gideon	(See Gideon listed in No. 10)					
Roellen	Severe: permeability, semsonally high water table	Slight: if protected Severe: if flooded		Severe: severe wetness, some areas flood, low bearing capacity, shrink-swell potential	Severe: low bearing capacity, severe wetness, shrint-swell potential, very high corrosivity of uncoated steel, some areas flood	Severe: traffic sup- porting capacity, severe vetness, shrink-swell potential, some areas flood
Sikeston	Severe: permeability, seasonally high water table	Moderate: permeability	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table, traffic supporting capacity
1). Amagon-Fountain-Beulah	Beulah					
Amagon	(See Amagon listed under No. 16)					
Fountain	(See Fountain listed under No. 4)	(1				
Beulah	(See Beulah listed under No. 17)					
20. Loring-Memphis						
Loring	(See Loring listed under No. 40)					
Memphis	(See Memphie listed under No. 40)	(0)				

Appendix table II-2 (cont.)--Degree and kind of limitations for building sites, sewage and solid waste disposal systems
St. Francis River Basin

	Soil associations	Septic tank absorption field	Sevage lagoons	Sanitary Landfill (trench type)	Dwellings without basement	Small commercial building	Local roads and streets
Column   Content   Permethility   Server   Permethility   Server   Seasonality   Server   Server   Seasonality   Server   Server   Seasonality   Server   Server   Seasonality   Server   Server   Seasonality   Server   Seasonality   Server   Seasonality   Server   Seasonality   Server   Seasonality   Server   Server   Server   Seasonality   Server   Seasonality   Server   Server   Server   Seasonality   Server   Seasonality   Server		Fountain					
Colinging   Severic prescription   Severic personally high severic personally severic personally high severic personally high severic personally high severic personally high severic personally high severic personally severi	Calhoun	-27	slight	-	+		
	Calloway	(See Calloway listed under No.	34)				
Datable   Community   Commun	Fountain	Severe: permeability	Slight			Severe: corrosivity to uncoated steel, sessonally high water table	Severe: traffic supporting capacity, seasonally bigh water table
Disolate   See Bother listed under No. 11)   Bonder   See Bother listed under No. 11)   Bonder   See Bother listed under No. 11)   Bonder   See Bother listed under No. 11)   Commerce   See Bother listed under No. 11)   Commerce   See Bother listed under No. 11)   Commerce   See Bother listed under No. 12)   Sheels   Seever; persochility, see   Seever; per	- 1	qui					
Section   Stageth   Section   Stageth   Section   Sect	Dubbs	(See Dubbs listed under No. 27,					
Connected   Server: paramethility   Server: parameth	Bosket	(See Bosket listed under No. 1)	1)				
Commerce         Scorte:         Secret:         seasonally high water shile.         Severe:         seasonally high water table, some areas         Severe:         seasonally high water table, seasonally high water table.         Severe:         seasonally high water table, seasonally high water table.         Severe:	Beulah	Slight		Severe: permeability	Slight	Slight	Slight
Commerce   Server: promebility, sace   Server: seasonally high   Server: seasonally high   Server: seasonally high vater table, some area   fined table, some area   fine		nville-Convent					
Convent   Conv	Comerce	Severe: permeability, some areas flod, seasonally high water table	Severe: seasonally high water table, some areas flood	Severe: geasonally high water table, some areas flood	Moderate: seasonally high water table, some areas flood	Moderate: seasonally high water table, corrosivity, some areas flood	Moderate: sessonally high water table, trafite supporting capacity, some areas flood
Convent series paraeability, see- sonally high vater table sonally high vater sonally high vater sonally high vater table sonally high vater table sonally high vater so	Robinsonville	Slight: severe if subject to flooding	Severe: permeability, some areas flood	Severe: permeability, some areas flood	Slight: severe if subject to flooding	<pre>glight: severe if subject to flooding</pre>	Slight: severe if subje to flooding
Sharkey-Tunica under No. 36)  Sharkey Steele (See Sharkey listed under No. 36)  Sharkey Steele (See Sharkey listed under No. 36)  Sharkey (See Sharkey listed under No. 36)  Steele Severe: permeability, sea-clayey subsoil, some crees andy surface and somely high water table (looding some crees)  Steele Severe: permeability, sea-clayey subsoil, some crees flood somely high water table, some areas flood somely high water table, to flooding some crees flood some crees flood some crees flood to flooding some crees flood to flooding some crees is subject; severe if subject to flooding some crees flood to flooding to	Convent			Ä	Moderate: bearing capacity, seasonally bigh water table	Moderate: bearing capacity, seasonally high water table	Moderate: traffic supporting capacity, seasonally high water table
Sharkey (See Sharkey listed under No. 36)  Steele Severe: permesbility, see- Severe: if subject to all permetal produing capacity Severe: if subject to appoint a permespility is severe: permesbility is severe: permesbil	- 1	(See Sharkey and Tunica under B	No. 36)				
Steele Severe: parmeability, sea- Severe: parmeability sea- Severe: parmea sea- Seve	- 1						
Steele Severe: permeability, seel clayery subsoil, some areas flood to flooding to flood and flooding to flood and flo	Sharkey	(See Sharkey listed under No. 5	36)				
Amagon Dundee-Crevasse  Amagon Severe: parameability, sea.  Severe: parameability, sea.  Solight: severe if subject  Severe: seasonally high some areas flood  Severe: permeability sea.  Severe: seasonally high some areas flood  Severe: permeability seare if subject  Severe: seasonally high severe: permeability seare if subject  Severe: seasonally high severe: looding  Crevasse  Slight: severe if subject  to flooding	Stele	7	Severe: sandy surface and clayey subsoil, some creas flood	c'at	Moderate: bearing capacity Severe: if subject to flooding	Moderate: bearing capacity, shrink-swell potential below 30 inches Severe: if subject to flooding	, and the , the
Severe: permeability, sea.  Slight: severe if subject some areas flood some areas flood some areas flood some areas flood capacity, some areas flood capacity capacit	1	evasse					
(See Dundee listed under Mo. 13) Slight: severe if subject Severe: permeability Slight: severe if subject Slight: severe if subject to flooding to flooding to flooding	Amagon	Severe: permeability, seg- sonally high water table, some areas flood	Slight: severe if subject to flooding	Severe: seasonally high water table, some areas flood	Severe: bearing espacity, some areas flood	Severe: seasonally high water table, low bearing capacity, some areas flood	777
Slight: severe if subject Severe: permeability Severe: permeability Slight: severe if subject Slight: severe if subject to flooding to flooding to flooding	Dundee	(See Dundee listed under No. 1:	3)				
	Crevasse	Slight: severe if subject to flooding	Severe: permeability	Severe: permeability	Slight: severe if subject to flooding	Slight: severe if subject to flooding	Slight: severe if subject for flooding

Appendix table II-2 (cont.) -- Degree and kind of limitations for building sites, sewage and solid waste disposal systems St. Francis Siver Basin

Soil associations	Septic tank absorption field	Sevage Lagoons	Sanitary Landfill (trench type)	Drellings without basement	Small commercial building	Local roads and streets
27. Dundee-Dubbs						
Dundee	Severe: permeability, seasonally high water table	Slight	Severe: seasonally high water table	Severe: bearing capacity	Severe: seasonally high water table, bearing capacity, corrosivity	Severe: seasonally high water table, traffic supporting capacity
Dubbs	Slight	Moderate: permeability	Moderate: ssasomally high water table, above 5 feet in some areas	Moderate: bearing capacity	Moderate: bearing cepacity	Moderate: traffic supporting capacity
28. Henry-Calhoun-Calloway	Loring					
Henry	(See Henry listed under No. 41)	1)				
Calhoun	Severs: seasonally high water table, slow per- meability	Slight	Severe: seasonally high water table	Severe: seasonally high water table	Severe: corrosivity, season- ally high water table	Severe: seasonally high water table, traffic supporting cepacity
Calloway	(See Calloway listed under No. 41)	. 41)				
29. Hillemann-Henry						
Hillemann	Severe: permeability, seasonally high water table	Slight	Severe: sassonally high water table	Moderate: seasonally high water table, shrink- swell pokantial	Moderate: seasonally high water table, shrink- swell potential	Severe: seesonally high water table, shrink- swell potential
Henry	(See Henry 11sted under No. 41)	1)				
9. Alligator-Earle-Sharkey	Sharkey					
Alligator	Severe: permeability, seasonally high water table	Slight: severe if subject to flooding	Severe: texture, season- ally high water table, some areas flood	Severe: seasonally high water table, abrink-swell potential, some areas flood	Severe: seasonally high veter table, shrink-swell potential, corrosivity, some erees flood	Severe: traffic sup- porting capacity, shrink-swell potential, texture, some areas flood
Earle	Severe: permeability, seasonally high water table	Slight	Severe: texture, seasonally high water table	Severe: seasonally high water table, bearing cepacity, shrink-svell potential	Severe: seesonally high water table, bearing cepacity, shrink-swell potential	Severe: shrink-swell potential, traffic supporting cepacity
Sbarkey	(See Sharkey listed under No. 36)	36)				
31. Arkabutla-Collins	w.i					
Arkabutla	Severe: seasonally high water table, some areas flood	Moderate: permeability	Moderate: permeability, seasonally high water table	Moderats: seasonally high water table, some areas flood	Service: seasonally high water table, corrosivity	Moderate: seasonally high water table, traffic supporting capacity
Collins	Moderate: permeability Severe: if subject to flooding	Moderate: permeability Severe: if subject to flooding	Moderate: permeability Severe: if subject to flooding	Moderate: bearing capacity Serve: if subject to flooding	Moderate: bearing capacity Severe: if subject to flooding	Moderate: traffic sup- porting capacity Sevare: if subject to flooding

Appendix table II-2 (cont.) -- Degree and kind of limitations for building eites, sewage and solid waste disposal systems St. Francis Edwar Emain

Soil associations	Septic tank absorption field	Serage lagoons	Sanitary landfill (trench type)	Dwellings without basement	Small commercial huilding	Local roads and streets
32. Moon-Dundee						
Moon	Severe: permeahility, some areas flood	Slight	Severe: seasonally high water table	Severe: seasonally high water table, some areas flood	Sewere: bearing capacity, some areas flood	Severe: seasonally high water table, traffic supporting capacity
Dundee	(See Dundee listed under No. 13)	3)				
33. Alligator-Sharkey						
Alligator	(See Alligator listed under No. 8)	. 8)				
Sharkey	(See Sharkey listed under No. 36)	36)				
34. Calloway-Loring-Henry	tenry					
Calloway	Severe: seasonally high water table, permeability	Slight	Severe: seasonally high water table	Severe: seasonally high water table	Severe: seasonally high water table	Moderate: seasonally high water table, traffic supporting capacity
Loring	Severe: permeahility	Moderate: slope	Moderate: slope	Moderate: bearing capacity	Moderate: bearing capacity	Moderate: traffic supporting capacity
Henry	Severe: seasonally high water table, permeability	Slight	Severe: seasonally high water table	Severe: seasonally high water table.	Severe: seasonally high water table, bearing capacity	Severe: seasonally high water table, low traffic supporting capacity
35. Zachary-Tichnor						
Zachary and Tichnor	Severe: permeability, seasonally high water table, flooding	Moderate: texture, permea- hillty Severe: if subject to flooding	Severe: seasonally high water table, subject to flooding	Severe: seasonally high water table, subject to flooding	Severe: seasonally high water table, subject to flooding, corresivity	Severe: seasonally high water table, subject to flooding
36. Newellton-Sharkey-Tunica	-Tunica					
Revellton	Severe: sessonally high water table, some areas flood	Severe: seasonally high water table, some areas flood	Severe: texture, season- ally high water table, some areas flood	Moderate: sessonally high water table, shrink-swell potential, some areas flood	Moderate: seasonally high water table, shrink-swell potential Severe: In areas that flood	Severe: seasonally high water tehle, treffic supporting capacity, shrink-swell potential
Sharkey	Severe: seasonally high water table, permeability, some areas flood	Slight; eevere if subject to flooding	Severe: seasonally high water table, some areas flood	Severe: seasonally high water table, shrink- swell potential, some areas flood	Severe: seasonally high water table, shrink- evell potential, cor- rostvity, some areas	Severe: seasonally high water table, traffic supporting especity, ehrink-svall potential, some areas flood
Tunica	Severe: seasonally high water table, permeabil- ity, some areas flood	Severe: seasonally high water table, some areas flood	Severe: sessonally high water table, texture, ecme areas flood	Severe: seasonally high water table, shrink- swell potential, come areas flood	Severe: seasonally high water table, abrink-swell potential, corrosivity, some areas flood	Severe: seasonally high water table, shrink- swell potential, some areas flood

Appendix table II-2 (cont.)--Degree and kind of limitations for building sites, sewage and solid waste disposal systems
St. Francie River Basin

Soil associations	Septic tank absorption field	Sewage Lagoons	Sanitary landfill (trench type)	Dwellings without basement	Small ecomercial building	Local roads and streets
37. Memphis-Netchez						
Memphis	Severe: permeability, slope	Severe: permeability, slope	Severe: slope	Severe: slope	Severe: alope	Severe: slope
Netchez	Severe: permeability, alope	Severe: permeability, alope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
38. Mantechie-Iuka-Ochlockonee	chlockonee					
Mantechie	Moderate: sessonally high water table Severe: if subject to flooding	Moderate: permeability Severe: if subject to flooding	Severe: seasonally high water table	Moderate: beering capacity Severe: if subject to flooding	Moderate: bearing capacity Severe: if subject to flooding	Moderate: traffic supporting cepecity Severe: if subject to flooding
Iuka	Moderate: seasonally high water table Severe: if ambject to flooding	Moderate: permeability Severe: if subject to flooding	Severe: seasonally high water table, some areas flood	Moderate: seasonally high water table, moderate bearing capacity Severe: if subject to flooding	Moderate: moderate bearing capacity Severe: if subject to flooding	Moderate: traffic supporting capacity Severe: if subject to flooding
Ochlockonee	Slight: severe if subject to flooding	Severe: permeability	Slight: severe if subject to flooding	Slight: severe if subject to flooding	Slight: severe if subject to flooding	Slight: severe if subject to flooding
39. Alligator-Earle						
Alligator	Severe: permeability, sea- sonally high water table	Slight: severe if subject to flooding	Severe: texture, season- ally high water table, some areas flood	Severe: seasonally high water table, texture, shrink-swell potential, some areas flood	Severe: sassonally high water table, shrink-swell potential, corresivity, some areas flood	Severe: traffic sup- porting cepacity, abrink-swell potential, texture, some areas flood
Earle	Severe: permeability, ssa- sonally high water table	Slight	Severe: texture, seasonally high water table	Severe: sassonally high water table, bearing capacity, shrink-swell potential	Severe: seasonally high water table, shrink-swell potential, bearing capacity	Severe: shrink-swell potential, traffic aupporting capacity
40. Loring-Memphis-Grenada	renada					
Loring	Severe: parmeability	Moderate: slopes 0-7% Severe: slopes 7+%	Moderate: alopes 0-25% Severe: alopes 25+%	Moderate: slopes 2-15%, bearing especity Severe: slopes 15% and over	Moderate: alopes 2-8% Severe: alopes 8-20% and over	Moderate: slopes 2-15%, traffic supporting capacity Severe: slopes 15-20% and over
Memphis	Slight: slopes 0-8% Moderate: slopes 8-1% Severe: slopes 15+%	Moderate: slopes 0-7%, permeability Severe: slopes 7+%	Moderate: slopes 1-25% Severe: slopes 254%	Moderate: slopes 0-15%, bearing espatity Severe: slopes 15+%	Moderate: slopes 0-8%, bearing especity Severe: slopes 8+%	Moderate: slopes 0-15%, traffic supporting capacity Severe: slopes 15-4
Grenada	Severe: permeability	Slight: elopes 0-2% Noderate: alopes 2-7% Severe: alopes 7+%	Moderate: alopes 0-25% Sevare: alopes 25+%	Moderate: alopes 0-6%, seasonally high water table Moderate: alopes 6-12%	Moderate: slopes 0-8%, corrosivity Severe: slopes 8+%	Moderate: seasonally high water table, traffic supporting capacity
41. Calloway-Henry						
Селломау	Severe: seasonally high water table, permeability	Slight	Severe: seasonally high water table	Severe: saasonally high water table	Severe: seasonally high water table, corrosivity	Moderate: seasonally high water teble, traffic supporting capacity
Henry	Severe: seasonally high water table, permsability	slight	Severe: saasonally high water table	Severe: seasonally high water table, bearing eapacity	Severe: seasonally high water table, bearing capacity	Severe: seesonally high water table, traffic supporting capacity

Appendix table II-3--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
1. Clarksville-Doniphan-Lebanon	anon			
Clarksville	Severe: coarse fragments, slope	Severe: coarse fragments, slope (E&F)	Severe: coarse fragments, slope	Severe: coarse fragments, slope $(F)$
Doniphan	Moderate: 8 to 15% slopes, coarse fragments on surface Severe: over 15% slopes	Moderate: 8 to 15% slopes, coarse fragments on surface Severe: over 15% slopes	Severe: over 6% slopes, coarse fragments	Moderate: 15 to 25% slopes, coarse fragments Severe: over 25% slopes
Lebanon	Slight: 2 to 8% slopes Moderate: 8 to 14% slopes	Slight: 2 to 8% slopes Moderate: 8 to 14% slopes	Moderate: 2 to 6% slopes Severe: 6 to $14\%$ slopes	Slight
2. Crider-Hagerstown-Bardley				
Crider	Slight: less than 8% slopes Moderate: 8 to 15% slopes	Slight: less than 8% slopes Moderate: 8 to 15% slopes	Moderate: 3 to 6% slopes Severe: over 6% slopes	Slight: less than 15% slopes
Hagerstown	Moderate: 8 to 15% slopes	Moderate: 8 to 15% slopes	Severe: over 6% slopes	Slight
Bardley	Moderate: coarse fragments, slope	Moderate: coarse fragments, slope	Severe: coarse fragments, slope, depth to bedrock	Moderate: coarse fragments
3. Tilsit-Hector				
Tilsit	Slight: 1 to 8% slopes Moderate: 8 to 15% slopes	Slight: 1 to 8% slopes Moderate: 8 to 15% slopes	Slight: 1 to 2% slopes Moderate: 2 to 6% slopes Severe: 6 to 15% slopes	Slight
Hector	Moderate: slope, coarse fragments, trafficability Severe: 8% + slopes, coarse fragments, trafficability	Moderate to severe: coarse fragments, trafficability Severe: $8\% + \text{slopes}$ , coarse fragments, trafficability	Severe: depth to bedrock, coarse fragments, trafficability	Slight to moderate: 2 to 15% slopes, coarse fragments Moderate: 15 to 25% slopes Severe: over 25% slopes
4. Midco-Gladden-Sharen				
Midco	Severe: flooding	Moderate: flooding	Moderate: flooding	Slight
Gladden	Slight to severe: some areas flood	Slight to severe: some areas flood	Slight to severe: some areas flood	Slight
Sharen	Slight: unflooded Severe: flooded	Slight: unflooded Severe: flooded	Slight: unflooded Moderate to severe: flooded	Slight

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils 5t. rrancis kiver basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
5. Unnemed Soils	(DATA NOT AVAILABLE)			
6. Doniphan-Union				
Doniphan	(See Doniphan under No. 1)			
Union	Slight: 3 to 8% slopes Moderate: 8 to 15% slopes Severe: 15 to 20% slopes	Slight: 3 to 8% slopes Moderate: 8 to 15% slopes Severe: 15 to 20% slopes	Moderate: 3 to $8\%$ slopes Severe: 6 to $20\%$ slopes	Slight: 3 to 15% slopes Moderate: 15 to 25% slopes
7. Falaya-Collins				
Falaya	Severe: wetness, flooding	Moderate: wetness, flooding	Severe: wetness, flooding	Moderate: wetness, flooding
Collins	Severe: flooding	Moderate: flooding	Severe: flooding	Slight
8. Calhoun-Wrightsville				
Calhoun	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Wrightsville	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
9. Loring-Memphis				
Loring	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: 15 to 20% slopes	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: 15 to 20% slopes	Slight: 2 to 6% slopes, permeability Severe: 6 to 20% slopes	Slight: 2 to 15% slopes Moderate: 15 to 20% slopes
Memphis	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: over 6% slopes	Slight: 0 to 15% slopes Moderate: 15 to 20% slopes Severe: 25 to 40% slopes
10. Gideon-Wardell-Lilbourn				
Gideon	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Wardell	Severe: wetness	Severe: wetness	Moderate to severe: wetness	Moderate: wetness
Lilbourn	Moderate to severe:	Moderate: wetness	Moderate to severe:	Moderate: wetness

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
11. Bosket-Broseley Bosket	Slight to moderate: no flooding in season of use if leveed	Slight	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: 6 to 8% slopes	Slight
Broseley 12. Sharkey	Moderate: 0 to 8% slopes, texture Moderate: 8 to 12% slopes, texture	Moderate: 0 to 8% slopes, texture Moderate: 8 to 12% slopes, texture	Moderate: 0 to 2% slopes, sandy Moderate: 2 to 6% slopes, sandy Severe: over 6% slopes	Moderate: texture
Sharkey 13. Dundee	Severe: wetness, permea- bility, texture, flood- ing on flooded phases	Severe: wetness, texture	Severe: wetness, permea- bility, texture	Severe: wetness, texture, flooding on flooded phases
Dundee	Moderate: wetness, per- meability	Moderate: wetness	Moderate: wetness	Moderate: wetness
Bosket	(See Bosket under No. 11)			
Beulah	Slight	Slight	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: 6 to 8% slopes	Slight
Broseley	(See Broseley under No. 11)			
15. Commerce-Crevasse-Caruthersville	ersville			
Commerce	Moderate: wetness, permeability Severe: if subject to flooding	Moderate: wetness Severe: if subject to flooding	Moderate: wetness, permeability Severe: if subject to flooding	Moderate: wetness, some areas flood
Crevasse	Moderate to severe: texture	Moderate to severe: texture	Severe: texture	Moderate to severe: texture
Caruthersville	None-slight: if protected Severe: if subject to flooding	Slight: if protected Moderate: flooding	Slight: if protected Moderate: flooding	None-slight: if protected Moderate: flooding

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

	Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
16.	Hayti-Portageville-Cooter				
	Hayti	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
	Portageville	Severe: wetness	Severe: wetness, texture	Severe: wetness, texture	Severe: Wetness, texture
	Cooter	Severe: texture, occasional flooding	Severe: texture	Severe: over 6% slopes, texture, occasional flooding	Severe: texture, flooding
17.	Lilbourn-Crevasse-Canalou				
	Lilbourn	(See Lilbourn under No. 10)			
	Crevasse	(See Crevasse under No. 15)			
	Canalou	(NO DATA AVAILABLE)			
18.	Gideon-Roellen-Sikeston				
	Gideon	(See Gideon Under No. 10)			
	Roellen	Severe: wetness, texture, permeability, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, permea- bility, some areas flood	Severe: wetness, texture, some areas flood
	Sikeston	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
19.	Amagon-Fountain-Beulah				
	Amagon	(See Amagon under No. 16)			
	Fountain	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
	Beulah	(See Beulah under No. 17)			
20.	Loring-Memphis				
	Loring	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Moderate: 2 to 6% slopes Severe: 6 to 20% slopes	Slight: 2 to 15% slopes Moderate: over 15% slopes
	Memphis	(See Memphis under No. 37)			

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. rrancis kiver Basin

		2		W. A. C.
SOLL associations	camp areas	richic areas	Fraygromus	rath and traits
21. Calhoun-Calloway-Fountain	<u>in</u>			
Calhoun	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Calloway	(See Calloway under No. 34)			
Fountain	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
22. Dubbs-Bosket-Beulah				
Dubbs	(See Dubbs under No. 27)			
Bosket	Slight	Slight	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes	Slight
Beulah	Slight	Slight	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes	Slight
23. Commerce-Robinsonville-Convent	Convent			
Commerce	Moderate: wetness, per- meability Severe: if subject to flooding	Moderate: wetness Severe: if subject to flooding	Moderate: wetness, per- meability Severe: if subject to flooding	Moderate: wetness, some areas subject to flooding
Robinsonville	Slight Severe: if subject to flooding	Slight Severe: if subject to flooding	Slight Severe: if subject to flooding	Slight
Convent	Moderate: wetness Severe: if subject to flooding	Moderate: wetness Severe: if subject to flooding	Moderate: wetness Severe: if subject to flooding	Moderate: wetness Severe: if subject to flooding
24. Sharkey-Tunica				
Sharkey	(See Sharkey under No. 36)			
Tunica	Severe: wetness, texture, permeability, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, texture, permeability, some areas flood	Severe: wetness, texture, some areas flood
25. Sharkey-Steele				
Sharkey	(See Sharkey under No. 36)			
Steele	Severe: trafficability, some areas flood	Severe: trafficability, some areas flood	Severe: trafficability, some areas flood	Moderate: some areas

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
26. Amagon-Dundee-Crevasse				
Amagon	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Dundee	(See Dundee under No. 27)			
Crevasse	(See Crevasse under No. 15)			
27. Dundee-Dubbs				
Dundee	Moderate: wetness, permeability	Moderate: wetness	Moderate: wetness	Moderate: wetness
Dubbs	Slight	Slight	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: 6 to 8% slopes	Slight
28. Henry-Calhoun-Calloway				
Henry	(See Henry under No. 41)			
Calhoun	Severe: wetness	Severe: wetness	Severe: wetness	
Calloway	(See Calloway under No. 41)			
29. Hillemann-Henry				
Hillemann	Moderate: wetness, perme- ability	Moderate: wetness	Moderate: wetness, perme- ability	Moderate: wetness
Henry	(See Henry under No. 41)			
30. Alligator-Earle-Sharkey				
Alligator	Severe: permeability, texture, some areas flood, wetness	Severe: wetness, texture, some areas flood	Severe: wetness, permea- bility, clayey, some areas flood	Severe: wetness, texture some areas flood
Earle	Severe: wetness, permea- bility, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, permea- bility, texture, some areas flood	Severe: wetness, texture
Sharkey	(See Sharkey under No. 36)			

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. rancis River Basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
31. Arkabutla-Collins				
Arkabutla	Moderate: wetness Severe: if subject to flooding	Moderate: wetness, some areas flood	Moderate: wetness Severe: if subject to flooding	Moderate: wetness, some areas subject to flooding
Collins	Severe: flooding	Severe: flooding	Severe: flooding	Slight
32. Mhoon-Dundee				
Mhoon	Severe: wetness, some areas flood	Severe: wetness, some areas flood	Severe: wetness, some areas flood	Severe: wetness, some areas flood
Dandee	(See Dundee under No. 27)			
33. Alligator-Sharkey				
Alligator	(See Alligator under No. 30)	(		
Sharkey	(See Sharkey under No. 36)			
34. Calloway-Loring-Henry				
Calloway	(See Calloway under No. 41)			
Loring	(See Loring under No. 20)			
Henry	(See Henry under No. 41)			
35. Zachary-Tichnor				
Zachary and Tichnor	Severe: wetness, flooding	Severe: wetness, flooding	Severe: wetness, flooding	Severe: wetness, flooding
36. Newellton-Sharkey-Tunica				
Newellton	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood
Sharkey	Severe: wetness, permea- bility, texture, some areas flood	Severe: wetness, permea- bility, texture, some areas flood	Severe: wetness, permeability, texture, some areas flood	Severe: wetness, texture, some areas flood
Tunica	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

Soil associations	Camp areas	Picnic areas	Playgrounds	Path and trails
37. Memphis-Natchez				
Memphis	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: over 6% slopes	Slight: 0 to 15% slopes Moderate: 15 to 25% slopes Severe: 25 to 40% slopes
Natchez	Moderate: 12 to 15% slopes Severe: 15% slopes and over	Severe: 15% slopes and over	Severe: slopes	Moderate: 12 to 25% slopes Severe: 25% slopes and over
38. Mantachie-Iuka-Ochlockonee	e e			
Mantachie	Severe: wetness, some . areas flood	Severe: wetness, some areas flood	Severe: wetness, some areas flood	Moderate: wetness, some areas flood
Iuka	Slight Severe: if subject to flocding	Slight Severe: if subject to flooding	Slight Severe: if subject to flooding	Slight Severe: if subject to flooding
Ochlockonee	Slight Severe: if subject to flooding	Slight Moderate: if subject to flooding	Slight Moderate: if subject to flooding	Slight Moderate: if subject to flooding
39. Alligator-Earle				
Alligator	Severe: wetness, permea- bility, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, permeability, texture, some areas flood	Severe: wetness, texture, some areas flood
Earle	Severe: wetness, texture, some areas flood	Severe: wetness, texture, some areas flood	Severe: wetness, permeability, texture	Severe: wetness, texture
40. Loring-Memphis-Grenada				
Loring	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 2 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Moderate: 2 to $6\%$ slopes Severe: over $6\%$ slopes	Slight: 2 to 15% slopes Moderate: over 15% slopes
Memphis	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 8% slopes Moderate: 8 to 15% slopes Severe: over 15% slopes	Slight: 0 to 2% slopes Moderate: 2 to 6% slopes Severe: over 6% slopes	Slight: 0 to 15% slopes Moderate: 15 to 25% slopes Severe: 25 to 40% slopes
Grenada	Moderate: wetness, permea- bility	Moderate: wetness	Moderate: 0 to 6% slopes Severe: over 6% slopes, wetness, permeability	Slight

Appendix table II-3 (cont.)--Degree and kind of limitations for selected recreational uses of soils St. Francis River Basin

Path and trails	Moderate: wetness	Severe: wetness
Playgrounds	Moderate: wetness, perme- ability	Severe: wetness
Picnic areas	Moderate: wetness	Severe: Wetness
Cemp areas	Moderate: wetness, perme- ability	Severe: wetness
Soil associations	41. Calloway-Henry Calloway	Henry

	Soil Associations	Corn	Rice	Cotton	Soybeans	Wheat
		(bu.)	(bu.)	(L-lb.)	(bu.)	(bu.)
	rksville-Doniphan-Lebanon	_	_	_	_	20
-	oniphan	-		_	_	28
	ebanon	30-55	-	-	-	28-35
	der-Hagerstown-Bardley	r/ 00			00.25	00 1:0
	rider	56 <b>-</b> 90 65 <b>-</b> 75	-	-	20-35	20 <b>-</b> 40 25 <b>-</b> 30
	agerstown ardley	- CJ-19	-	_	_	20
	·					
	sit-Hector	70.75		450-500		
	lilsit Mector	70 <b>-</b> 75	_	450-500	-	20 <b>-</b> 25
	66 001					20 2)
	co-Gladden-Sharen	1.4				
	lideo	40 70	-	-	-	30 43
	ladden haren	100-125	-	-	40	43
	niai cii	-				
5. <u>Unn</u>	amed Soil	(No avai	lable data)			
	iphan-Union					
	Doniphan	- 50.70		<del>-</del>	-	25 <b>-</b> 40
C	Inion	50-70	-	-	-	27-40
7. Fal	aya-Collins					
	alaya	100	-	700	35-40	-
C	collins	<b>9</b> 5	-	800	35	40
8. <b>Cal</b>	houn-Wrightsville					
	alhoun	-	120	400	25	-
W	rightsville	-	90	450	25	-
0 7	to a Manager					
	ring-Memphis Oring	60-90	_	500-700	20-30	32-40
	lemphis	65-100	-	600-800	25-35	30-40
	-					
	leon-Wardell-Lilbourn	95.05		F00 F50	10 10	
	ideon Mardell	85 <b>-9</b> 5 70 <b>-</b> 80	70	720 <b>-</b> 750 600-675	40-42	
	ilbourn	75 <b>-1</b> 20	10 <b>-</b>	500-700	30-45	_
		.,				
	ket-Eroseley	0-		<b>( </b>	-0	1-
	Sosket	75 <b>-</b> 85	-	650-725	28-32	30-40
I	Bros <b>eley</b>	55 <b>-</b> 70	-	400-500	25 <b>-</b> 35	-
12. Sha	rkey					
	Charkey	-	120	500-550	30-35	-
13. Dur	nd a a					
	oundee	80-85	-	700-750	35-40	_
•		00 0)		100 170	37 .0	
	ket-Beulah-Broseley					
	Bosket Beulah	75 <b>-</b> 85 55 <b>-</b> 65	-	650 <b>-72</b> 5	28 <b>-</b> 32	30-40
	sewan Broseley	55 <b>-</b> 70	-	450 <b>-</b> 500 400 <b>-</b> 500	30 <b>-</b> 35 25 <b>-</b> 35	35~40
•	2000103	JJ-10		400-700	27-37	
	mmerce-Crevasse-Caruthersville	0		0		
	Commerce	85 <b>-95</b>	-	800-900	35-40	-
	Crevasse Caruthersville	110		900	- 45	-
				,00	*/	
	rti-Portageville-Cooter					
	layti	90	95	700	40	-
	Portageville Cooter	50 <b>-6</b> 5 <b>5</b> 5	90_	550 400	35 <b>-</b> 40	-
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	))	•	400	25	•

	Soil Associations	Corn	Rice	Cotton	Soybeans	Wheat
17	Lilbourn-Crevasse-Canalou	(bu.)	(bu.)	(L-1b.)	(bu.)	(bu.)
±7•	Lilbourn	75-120	_	500-700	30-45	-
	Canalou	1.5	t available)	700 100	30 17	
	Crevasse	-	-	-	-	-
18.	Gideon-Roellen-Sikeston					
	Gideon	85 <b>-</b> 95	-	720-750	40-42	-
	Roellen	-	90	-	<b>3</b> 5	-
	Sikeston	85	-	720	40	-
19.	Amagon-Fountain-Beulah					
	Amagon	-	-	600-650	30-35	35-40
	Fountain	-	90 <b>-11</b> 0	600-650	20-25	1.0.1.5
	Beulah	-	-	500-600	30-35	40-45
20.	Loring-Memphis	(0.00				1-
	Loring	60-90	-	500-700	20-30	32-40
	Memphis	65-100	-	600-800	25-35	30-40
21.	Calhoun-Calloway-Fountain		100 11	1		
	Calhoun		100-130	375-400	20-25	30 <del>-</del> 35
	Calloway Fountain		100-130 90 <b>-</b> 110	600 <b>-</b> 650 400-4 <b>7</b> 5	30-35 20 <b>-</b> 25	30 <b>-</b> 35 25 <b>-</b> 30
	rountain		90-110	400-41)	20-2)	2)-30
22.	<u>Dubbs-Bosket-Beulah</u> Dubbs			750 950	20 10	25 1.5
	Bosket		-	750-850 650-725	30-40 30 <b>-</b> 35	35-45 35-45
	Beulah		-	500-600	30 37	35 <b>-</b> 45
02	Communes Debinesonally					
23.	Commerce-Robinsonville Commerce		_	800-900	35-40	35-45
	Robinsonville		-	750-825	35 <b>-</b> 40	35 <b>-</b> 45
2h	Sharkey-Tunica					
<u>~</u> T•	Sharkey		100-130	500-550	30 <b>-</b> 35	30-35
	Tunica		-	5 <b>7</b> 5 <b>-</b> 625	30-35	35-40
25.	Sharkey-Steel					
-/•	Sharkey		100-130	500-550	30-35	30-35
	Steele		-	550-600	35-40	35-40
26.	Amagon-Dundee-Crevasse					
	Amagon		-	600-650	30-35	35-40
	Dundee		-	700-750	35-40	<b>35-4</b> 5
	Crevasse		-	-	-	25-30
27.	<u>Dundee-Dubbs</u>					
	Dundee Dubbs		-	700 <b>-7</b> 50	35-40	35-45
	Dubbs		-	<b>7</b> 50 <b>-</b> 850	30-40	<b>35-4</b> 5
28.	Henry-Calhoun-Calloway					
	Henry Calhoun		100-130	400-475	30-35	30 <b>-</b> 35
	Calloway		100-130 100-130	3 <b>7</b> 5-400 600-650	20 <b>-</b> 25 30 <b>-</b> 35	30 <b>-</b> 35 30-35
	·			,.	30 37	30 37
29.	Hillemann-Henry Hillemann		100-130	600-650	30 <b>-</b> 35	<b>30-3</b> 5
	Henry		100-130	400-475	30 <b>-</b> 35	30 <b>-</b> 35
20				,,	5 5/	3. 37
30,	Alligator-Earle-Sharkey Alligator		100-130	450-600	25 <b>-</b> 35	30-35
	Earle			650-700	25 <b>-</b> 35 30 <b>-3</b> 5	30 <b>-</b> 35 30 <b>-</b> 45
	Sharkey		100-130	500-550	30-35	30 <b>-</b> 35
31.	Arkabutla-Collins					
٠٠٠	Arkabutla Arkabutla		-	650-700	30-35	30-35
	Collins		-	750-800	35-40	35-40

Appendix table II-4 (cont.)--Average yields per acre of principal crops  $\underline{1}/$  St. Francis River Basin

Soil Associations	Corn	Rice	Cotton	Soybeans	Wheat
	(bu.)	(bu.)	(L-1b.)	(bu.)	(bu.)
32. Mhoon-Dundee			<b>/ </b>		1 -
Mhoon		-	650 <b>-7</b> 00 700 <b>-</b> 750	30 <b>-</b> 35 35 <b>-</b> 40	35-40
Dundee		-	700-750	35-40	35-45
33. Alligator-Sharkey					
Alligator		100-130	450 <b>-600</b>	25-35	30-35
Sharkey		100-130	500-550	30-35	30-35
34. Calloway-Loring-Henry					
Calloway		100-130	600-650	30-35	30 <b>-3</b> 5
Loring		-	500-700	25-30	30-35
Henry		100-130	400-475	25-30	30-35
35. Zachary-Tichnor					
Zachary		-	-	15-20	-
Tichnor		-	-	15-20	-
36. Newellton-Sharkey-Tunica					
Newellton		-	5 <b>75-</b> 800	30 <b>-3</b> 5	40-45
Sharkey		100-130	500-550	30-35	30-35
Tunica		-	575-625	30-35	35-40
37. Memphis-Natchez					
Memphis		-	-	-	-
Natchez		-	-	-	-
38. Mantachie-Iuka-Och ckonee					
Mantachie		-	600 <b>-</b> 625	30 <b>-</b> 35	30 <b>-</b> 35
Iuka		-	500-575	25-30	30-35
Och" ockonee		-	600-675	30 <b>-</b> 35	25-30
39. Alligator-Earle					
Alligator		100-130	450-600	25 <b>-</b> 35	30-35
Earle		-	650-700	30-35	30-45
40. Loring-Memphis					
Loring		-	-	-	-
Memphis		-	-	-	-
41. Calloway-Henry					
Calloway		100-130	600-650	30-35	30-35
Henry		100-130	400-475	25 <b>-</b> 30	30-35

<sup>1/</sup> Source of data, county soil surveys.

# Appendix table II-5--Land use by watersheds St. Francis River Basin, Arkansas and Missouri

Number	Cropland	Grassland	Forest land	Water	Other	Waters	hed Area
	Acres	Acres	Acres	Acres	Acres	Acres	Sq. Mi.
		Ab	owe Wappapello	Reservoir			
5-1	27,180	61,545	122,600	520	11,515	223,360	349.0
5-2	16,015	15,458	52,530	655	4,302	88,960	139.0
5-3	9,200	44,840	114,890	660	3,850	173,440	271.0
5-4	8,488	25,547	88,450	315	3,280	126,080	197.0
5-5	6,224	38,460	136,540	8 <b>,</b> 976	5,640	195,840	306.0
5 <b>-</b> 5a	2,000	7,100	21,500	•	120	30,720	48.0
Subtotal	69,107	192,950	536,510	11,126	28,707	838,400	1,310.0
		Main S	tem Below Wappa	pello Reservo	ir		
5 <b>÷</b> 7	118,700	23 220	58,480	8,620	— 7,940	216,960	339.0
5 <b>-</b> 8	51,530	23,220 1,380	3,160	440	2,370	58,880	92.0
5 <b>-</b> 9	13,195	3 <b>,</b> 760	1,880	505	500	19,840	31.0
5 <b>-1</b> 0	50,366	6,400	6,268	90	7,020	70,144	109.6
5-11	64,668	320	295	-	3,837	69,120	108.0
5-11a	24,950	460	120	***	1,350	26,880	42.0
5-12	65,676	160	290	130	560	66,816	104.4
5-13	94,960	12,600	19,200	920	9,280	136,960	214.0
5-14	40,533	2,500	5,600	68	1,219	49,920	78.0
5 <b>-1</b> 5	184,908	1,150	577	401	19,044	206,080	322.0
5-15a	26,800	350	700	40	2,830	30,720	48.0
5 <b>-1</b> 5b	40,845	475	730	500	2,250	44,800	70.0
5 <b>-1</b> 6	45,004	480	147	1,042	12,207	58,880	92.0
5 <b>-1</b> 7	17,331	336	48	370	603	18,688	29.2
5 <b>-1</b> 9	220,484	1,261	600	4,166	12,081	238,592	372.8
5-20	26,169	2,183	48,118	3,870	300	80,640	126.0
5-21	162,674	8,240	8,950	618	14,526	195,008	304.7
5-22	32,540	5,992	8,380	720	3,760	51,392	80.3
5 <b>-</b> 23	55,732	12,025	43,789	2,094	5,400	119,040	186.0
5-24	79,189	346	1,360	2,085	4,060	87,040	136.0
5 <b>-</b> 25	94,340	132	640	1,103	8,105	104,320	163.0
5 <b>-</b> 26	56,301	327	490	811	4,791	62,720	98.0 98.0
5 <b>-</b> 27	49,717	1,284 444	4,272	2,918	4,529	62,720	142.0
5 <b>-</b> 28	82,360	260	2,370	1,779	3,927 2,443	90,880	
5 <b>-</b> 29 5 <b>-</b> 30	47,397 61,805	200	710 3,300	1,030 205	1,250	51,840 66,560	81.0 104.0
5 <b>-31</b>	68,441	394	1,355	87 <b>1</b>	4,459	75,520	118.0
5 <b>-</b> 32	36,473	394 941	650	643	10,573	49,280	77.0
5 <b>-</b> 33	56,393	856	5,33 <sup>4</sup>	768	2,825	66,176	103.4
5-33a	27,466	578	4,200	2,486	1,494	36,224	56.6
5-34	66,319	200	23,117	3,044	1,400	94,080	147.0
5-35	-	50	24,235	1,815	1,420	27,520	43.0
5-35a	1,000	300	12,200	500	2,000	16,000	25.0
Subtotal	2,064,266	89,404	291,565	44,652	160,353	2,650,240	4,141.0

# Appendix table II-5 (cont.)--Land use by watersheds St. Francis River Basin, Arkansas and Missouri

Number	Cropland	Grassland	Forest land	Water	Other	Water	shed Area
	Acres	Acres	Acres	Acres	Acres	Acres	SqMi.
			Little River	System			
5a-0	-	970	3,455	4,500	35	8,960	14.0
5a-1	118,306	12,500	12,790	24	6 <b>,</b> 780	150,400	235.0
5a-3	4,870	1,120	3,200	40	370	9,600	15.0
5a-5	93,478	9,100	10,590	1,272	3,960	118,400	185.0
5a-6	77,687	1,900	2,880	3	2,650	85,120	133.0
5a-7	174,200	2,250	1,880	220	16,650	195,200	305.0
5a-8	163,965	4,525	4,740	90	11,640	184,960	289.0
5a-9	115,670	1,150	1,240	200	11,020	129,280	202.0
5a-10	180,223	870	745	1,299	13,983	197,120	308.0
5a-11	116,860	550	650	180	7,840	126,080	197.0
5a-11a	110,000	780	22,026	1,667	487	24,960	39.0
•	74,513	940	1,640	1,823	4,284	83,200	130.0
5 <b>a-1</b> 2	(4,5)13	7+0	1,040	1,023	7,204		130.0
Subtotal	1,119,772	36,655	65,836	11,318	79,699	1,313,280	2,052.0
			L'Anguille R	liver			
5b-1	11,422	2,000	6,302	266	3,690	23,680	37.0
5b-2	31,668	500	2,167	105	1,400	35,840	56.0
5b <b>-</b> 3	28,750	1,517	6,946	102	6,845	44,160	69.0
5b-4	25,215	300	4,600	135	1,110	31,360	49.0
5b-5	36,092	2,400	11,400	128	6,300	56,320	88.0
5b-6	25,357	3,700	11,847	130	1,206	42,240	66.0
5b-7	50,220	2,560	2,680	46	1,454	56,960	89.0
5b-8	25,239	3,600	5,600	446	4,795	39,680	62.0
5b <b>-</b> 9	47,517	10,160	13,160	95	2,668	73,600	115.0
	60,263	650	7,600		,	71,680	112.0
5b-10		050		130	3,037		
5b <b>-11</b>	46,284	1 960	8,000	915	2,401	57,600	90.0
5b-12	50,370	1,868	10,780	728	3,454	67,200	105.0
Subtotal	438,397	29 <b>,</b> 255	91,082	3,226	38 <b>,3</b> 60	600,320	938.0
Total	3,691,542	348,264	984,993	70,322	307,119	5,402,240	8,441.0

Appendix table II-6 -- Channel classification, St. Francis River Basin

	တ	1	1															
Flow condition 3	ы	1	17	33	<del>1</del> 3	208	55	33	165	92	47	85	ָרָ בַּי	36	ಹ	O <del>1</del>	35	20
ow cond	I	(		4	7	23	ឧ	ന	<b>子</b>		<b>1</b> †	55	ر د د	ដ	91	6	Ħ	13
E	띪		)     	9		25	5		8		9	83	7.5	)	Ħ	21	က	
Type of channel before project 2/	0																	
el ber	Z	1			ന					7	ന	%	17	ĩ				
Type of chann	M		17	81	747	256	72	36	225	65	91	88	200	3	57	20	3	33
	V			35	56	174	알	23	120	<u>\$</u>	28	223	200	) & C	7	17	נו	1
Type of work 1/	VI III		1 1 1 1 1									22						
Type	I II		17	3	54	82	35	13	105	28	36	4E 6	611	183	52	53	35	22
Wshd.	Number		. 5-9	5-11	5-12	5-15	5-15b	5-16	5-21	5-25	5-29	5-31	78-0 59-11	5a-12	5p-7	5b-10	50-11	5b-12

existing channel or stream. III - Cleaning out natural or manmade channel (includes bar removal and major clearing and 1/I - Establishment of new channel including necessary stabilization measures. II - Enlargement or realinement of snagging operation). IV - Clearing and removal of loose debris within channel section. V - Stabilization as primary purpose (by continuous treatment or localized problem areas - present capacity adequate)

2/ M - Marmade ditch or previously modified channel. N - An unmodified, well-defined natural channel or stream.

surface runoff, other dry. S - Ponded water with no noticeable flow - caused by lack of outlet or high ground water some seasons of the year but little or no flow through other seasons. E - Ephemeral - flows only during periods of Pr - Perennial - flows at all times except during extreme drought. I - Intermittent - Continuous flow through 0 - None or practically no defined channel.

#### Appendix table II-6a--Classification of channels St. Francis River Basin

	T	ype	01	c c	ha	nr	ne]	<u> 1</u>	7				F1	OW	C	ond	lit	io	n 2	7	
Watershed	M	•		N					)			P	r			I			F	2	
	_		-		_		-	M	i	1	е	s	_	_	_			_	_		

St. Francis	River Below	Wappapello			
5-7 5-11a 5-13 5-14 5-19 5-26 5-27 5-33	58 36 51 37 367 78 67	11 37	15 8 10 121 4 16 17	13 12 21 14 91 27 10 20	30 24 22 13 155 58 41 13
5a-1 5a-5 5a-7 5a-8 5a-9 5a-10	143 50 188 229 105 256		67 18 74 148 28 50	50 12 92 71 40 61	26 20 22 10 37 145

 $<sup>\</sup>frac{1}{2}$ / See footnote 2, table II-6.  $\frac{2}{2}$ / See footnote 3, table II-6.

Appendix table II-6b--Channel classification by watersheds St. Francis River Basin 1/

Wshd. No.	PR	I	E	S
5-1 5-2 5-3 5-4 5-5 5-5a	45 40 65 30 60	150 100 120 100 100	200 150 150 100 100 50	60
5-20 5-23 5-24 5-28 5-30 5-32 5-34 5-35	80 50 40 25 35 10 50 20	60 75 100 60 30 30 50 25	50 100 100 40 75 60 100 30	50 30 30 10 5 10 30
5 <b>a-</b> 0 5 <b>a-</b> 3 5 <b>a-11</b> a		25	20	35
5b-1 5b-3 5b-4 5b-5 5b-6 5b-9	12 13 5 20 12 11	40 30 10 35 40 16	50 50 30 30 30 30	

<sup>1/</sup> See footnote 3, table II-6.

Appendix table II-7--Estimated use of ground water by principal use - 1970 St. Francis River Basin (million gallons per day)

Public Supply	Self Supplied Industry	Rural Use Domestic	Rural Use Livestock	Irrigation Rice	Irrigation Other Crops	Fish & Minnow Farms	Recreation & Wildlife Impoundments	Fuel- Electric Power	County Totals
1, 24 1, 24 1, 24 1, 24 1, 24 1, 24 1, 24 1, 32 1, 32	0 .72 .152 .05 .0 .0 .29 .30	1.05 1.05 1.05 60 60 1.13 1.13 80 80 99	%1984£199008349	12.63 17.77 12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	15.87 5.05 5.05 6.63 22.43 22.16 8.88	0 2° 8° 4° 4° 6° 6° 6° 6° 6° 6° 6° 6° 6° 6° 6° 6° 6°	000000d0000	000000022.08.0	26.05 38.33 38.23 38.27 13.98 14.05 55.97
19,62	9.70	6.95	.92	273.66	62,04	8,58	10.	1,10	382.58
10.00.1 85.00.1 10.00.1 10.00.1 10.00.1 10.00.1 10.00.1 10.00.1	23.50 23.50 23.50 0	4 4 4 4 4 4 5 7 4 7 8 7 8 7 7 8 7 7 8 7 7 8 7 7 7 7 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	q.o.c.q.q.q.q.q.q.q.	0 0 0 3.00 0 14.54	.02 0.06 0.08 0.45 0.45 0.45 0.45	888880008000K8	000800000080		31. 92. 93. 94. 94. 94. 94.
8.02	34.83	2.97	-28	8.39	35.03	1.56	₹.	0	21.26
28.64	44.53 49,873	9.92	1,20 1,344	282.05 315,896	97.07	10.14 11,357	.05	1,232	474,70 531,663
			23.72 6.96 6.96 9.70 9.70 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90 10.90	1.05 1.05 1.02 1.22 1.02 1.03 0 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0.04 0 0 0 0	1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05	1.22 1.05 1.15 1.2.63   2.05 1.02 2.08 27.38   2.15 .60 1.13 6.82   2.29 .80 .01 3.99   2.20 .80 .06 78.44   2.20 .00 .00   2.20 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00 .00   2.30 .00 .00   2.30 .00 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2.30 .00   2	1.22 1.05 1.10 12.63 15.87 1.22 1.5.87 1.22 1.5.87 1.05 1.02 1.08 1.27.98 5.05 1.02 1.02 1.00 1.00 1.3 1.00 1.00 1.00 1.00 1.00	1.72 1.05 .11 12.63 15.87 .23 1.22 .70 .44 .55.98 .56.53 2.46 1.22 .70 .14 .65.99 .39 .39 .39 1.29 .80 .06 .76.44 .22.16 .80 2.9 .80 .06 .76.44 .22.16 .80 2.0 .01 .00 .06 .00 .00 2.0 .01 .02 .01 .00 .00 .00 2.0 .02 .03 .00 .00 .00 2.0 .03 .00 .00 .00 .00 2.0 .04 .01 .0 .0 .00 .00 2.0 .06 .00 .00 .00 .00 2.0 .00 .00 .00 .00 .00 2.0 .00 .00 .00 .00 2.0 .00 .00 .00 .00 .00 .00 2.0 .00 .00 .00 .00 .00 .00 .00 2.0 .00 .00 .00 .00 .00 .00 .00 .00 2.0 .00 .00 .00 .00 .00 .00 .00 .00 .00	1.72 1.05 .11 12.63 15.87 .23 0 1.22 .70 .11 65.99 6.63 2.46 0 1.12 .60 .13 6.80 2.44 3 .34 0 2.9 .60 .00 .00 .00 .00 .00 .00 .00 .00 .00

Counties and towns	Population
Arkansas portion of	f basin
Clay County	
Patterson	417
Piggott	3,087
Rector	1,990
St. Francis	297
Greenway	240
Craighead County	
Bay	751
Black Oaks	272
Brookland	465
Caraway	952
Farville	350
Jonesboro	27,050
Lake City	948
Lakeview	200
Monette	1,076
Crittenden County	
Crawfordsville	831
Earle	3,146
Gilmore	461
Heafer-Black Oak	300
Marion	1,634
Turrell	783
West Memphis	25,892
Cross County	
Cherry Valley	556
Ḥickory Ridge	410
Parkin	1,731
Wynne	6,696
Greene County	
Alexander	297
Center Hill	1,201
Marmaduke	821
Paragould	10,639
Lee County	
Marianna	6,196

Counties and towns	Population
Arkansas portion of basin	(cont.)
Mississippi County	
Armorel	150
Bassett	265
Blytheville	24,752
Burdett	173
Dell	358
Dogwood	300
Dyess	433
Gosnell	1,386
Grider-Driver	350
Joiner	839
Keiser	688
Leachville	1,582
Little River	400
Luxora	1,566
Manila	1,961
Osceola	7,204
West Ridge	160
Wilson	1,009
Yarbro	300
Phillips County	
Helena	10,415
St. Francis County	
Caldwell	292
Forrest City	12,521
Hughes	1,872
Madison	984
Widener	292
Poinsett County	
Black Oak	272
Fisher	361
Harrisburg	1,931
Lepanto	1,846
Marked Tree	3,208
Payneway	190
Trumann	5,938
Tyronza	510
Weiner	715

Appendix table II-8 (cont.)--Cities and towns with population over 100 that utilize ground water for municipal use, St. Francis River Basin

Counties and towns	Population
Missouri portion of	basin
Stoddard County	
Advance City	903
Bell City	424
Bernie	1,641
Bloomfield	1,584
Dexter	6,024
Dudley	248
Essex	1,040
Grayridge	250
Puxico	759
Dunklin County	
Arbyrd	575
Campbell	1,979
Cardwell	886
Clarkton	1,177
Holcomb	593
Hornersville	693
Kennett	9,852
Malden	5,374
Senath	1,484
Scott County	
Benton	640
Chaffee	2,793
Kelso	401
Miner	640
Morley	528
Oran	1,226
Scott City	2,464
Sikeston	14,690
Vanduser	306
Iron County	
Annapolis	330
Arcadia	627

Counties and towns	Population
Missouri portion of basin (cont.	.)
New Madrid County	
Gideon	1,112
Howardville	500
Lilbourn	1,152
Marston	666
Matthews	538
Morehouse	1,332
New Madrid	2,719
North Lilbourn	334
Parma	1,051
Point Pleasant	115
Portageville	3,113
Risco	412
Pemiscot County	
Braggadocio	400
Bragg City	210
Caruthersville	7,350
Cooter	414
Deering	138
Hayti	3,841
Holland	329
Pascula	180
Homestown	273
Steele	2,107
Wardell	275
St. Francois County	
Bismarck	1,387
Farmington	6,590
Cape Girardeau County	
Delta	462
Wayne County	
Greenville	321

### Appendix table II-9--Fish species inhabiting the St. Francis River Basin (a minimum checklist) $\underline{1}/$

#### I Fishes found throughout the basin

1.	Chestnut Lamprey	12. Redfin Shiner	23. Blackspotted Topminnow
2.	Southern Brook Lamprey	13. Northern Studfish	24. Mosquitofish
3.	Shortnose Gar	14. Bluntnose Minnow	25. Brook Silverside
-	Spotted Gar	15. Northern Redhorse	26. Largemouth Bass
	Longnose Gar	16. River Redhorse	27. Green Sunfish
6.	Bowfin	17. Black Bullhead	28. Longear Sunfish
7.	Gizzard Shad	18. Yellow Bullhead	29. Bluegill
8.	Grass Pickerel	19. Channel Catfish	30. Rock Bass
9•	European Carp	20. Stoneroller	31. Sauger
10.	Creek Chub	21. Black Redhorse	32. Dusky Darter
11.	Emerald Shiner	22. Creek Chubsucker	33. Rainbow Darter

#### II Fishes found only in the Ozark Highland Major Land Resource Area

1. Least Brook Lamprey	10. Ozark Minnow	19. Log Perch
2. Hornyhead Chub	ll. Slim Minnow	20. Gilt Darter
3. Southern Redbelly Dace	12. Largescale Stoneroller	21. Johnny Darter
4. Rosyface Shiner	13. Hogsucker	22. Banded Darter
<ol><li>Telescope Shiner</li></ol>	14. Golden Redhorse	23. Greenside Darter
6. Bleeding Shiner	15. Slender Madtom	24. Orangethroat Darter
7. Striped Shiner	16. Ozark Madtom	25. Fantail Darter
8. Bigeye Shiner	17. Smallmouth Bass	26. Banded Sculpin
9. Steelcolor Shiner	18. Walleye	

## III Fishes found only in the Southern Mississippi Valley Alluvium MLRA and in the Southern Mississippi Valley Silty Uplands MLRA

1.	American Eel	21.	Spotted Sucker	41.	Black Crappie
2.	Goldeye		Lake Chubsucker		White Crappie
	Golden Shiner	23.	Brown Bullhead	43.	Flier
	Pugnose Minnow	24.	Blue Catfish	44.	Banded Pygmy Sunfish
5.	Suckermouth Minnow	25.	Tadpole Madtom		Eastern Swamp Darter
6.	Ribbon Shiner	26.	Freckled Madtom	46.	Blackside Darter
7.	Ironcolor Shiner	27.	Stonecat	47.	River Darter
8.	Weed Shiner	28.	Brindled Madtom	48.	Stargazing Darter
9.	Blacktail Shiner	29.	Flathead Catfish	49.	Crystal Darter
10.	Red Shiner	30.	Pirate Perch	50.	Western Sand Darter
11.	Mimic Shiner	31.	Starhead Topminnow	51.	Scaly Sand Darter
12.	Chost Shiner	32.	Blackstripe Topminnow	52.	Bluntnose Darter
13.	Central Silvery Minnow	33.	White Bass	53.	Speckled Darter
14.	Cypress Minnow	34.	Yellow Bass	54.	Harlequin Darter
15.	Fathead Minnow	35.	Spotted Bass	55.	Mud Darter
16.	Bullhead Minnow	36.	Redear Sunfish	56.	Slough Darter
17.	Bigmouth Buffalofish	37.	Warmouth	57.	Cypress Darter
18.	Smallmouth Buffalofish	38.	Bantam Sunfish	58.	Freshwater Drum
19.	Black Buffalofish	39.	Spotted Sunfish		
20.	River Carpsucker	40.	Orangespotted Sunfish		

<sup>1/</sup> Common names taken from Pflieger's A Distributional Study of Missouri Fishes.

### Appendix table II-10--Amphibian species inhabiting the St. Francis River Basin (a minimum checklist) 1/

I Amphibians found throughout the basin

#### Salamanders

- 1. Western Lesser Siren
- 2. Central Newt
- 3. Spotted Salamander
- 4. Small-Mouthed Salamander
- 5. Marbled Salamander
- 6. Eastern Tiger Salamander
- 7. Mudpuppy

#### Toads and Frogs

- 1. Eastern Spadefoot
- 2. Dwarf American Toad

- 3. Fowler's Toad
- 4. Northern Spring Peeper
- 5. Eastern Gray Treefrog
- 6. Western Bird-Voiced Treefrog
- 7. Green Treefrog
- 8. Eastern Narrow-Mouthed Toad
- 9. Blanchard's Cricket Frog
- 10. Pickerel Frog
- 11. Green Frog
- 12. Southern Leopard Frog
- 13. Bullfrog
- 14. Crawfish Frog
- II Amphibians found only in the Ozark Highland Major Land Resource Area

#### Salamanders

- 1. Ozark Hellbender
- 2. Red-Backed Salamander
- 3. Slimy Salamander
- 4. Dark-Sided Salamander

- 5. Long-Tailed Salamander
- 6. Cave Salamander
- 7. Grotto Salamander

#### Toads and Frogs

- 1. Western Chorus Frog
- III Amphibians found only in the Southern Mississippi Valley Alluvium MLRA and the Southern Mississippi Valley Silty Uplands MLRA

#### Salamanders

- 1. Three-toed Amphiuma
- 2. Red River Waterdog
- 3. Mole Salamander
- 4. Greater Siren

#### Toads and Frogs

- 1. Northern Cricket Frog
- 2. Upland Chorus Frog
- 3. Bronze Frog
- 4. Southern Chorus Frog
- 1/ Common names taken from Conant's A Field Guide to Reptiles and Amphibians

Reptiles found throughout the basin

#### Turtles

l.	Common	Snapping	Turtle
2.	Alligat	or Snappi	ng Turtle

3. Stinkpot

4. Three-toed Box Turtle

5. Map Turtle

6. Mississippi Map Turtle

7. Ouachita Map Turtle 8. Missouri Slider

9. Slider

10. Red-eared Turtle

11. Western Spiny Soft-Shelled Turtle

12. Smooth Soft-Shelled Turtle

13. Ornate Box Turtle

#### Lizards

1. Northern Fence Lizard 2. Glass "Snake"

3. Six-lined Racerunner

4. Ground Skink

5. Five-lined Skink

6. Broad-headed Skink

7. Southern Coal Skink

#### Snakes

1. Granham's Water Snake

2. Diamond-backed Water Snake

3. Midland Brown Snake

4. Northern Red-Bellied Snake

5. Western Ribbon Snake 6. Eastern Garter Snake

7. Rough Earth Snake 8. Western Earth Snake

9. Eastern Hognose Snake

10. Western Worm Snake

ll. Rough Green Snake

12. Prairie King Snake

13. Speckled King Snake

14. Red Milk Snake

15. Northern Copperhead

16. Western Cottonmouth

17. Great Plain Rat Snake 18. Black Rat Snake

TT Reptiles found only in the Ozark Highland Major Land Rescurce Area

#### Turtles

1. Western Painted Turtle

#### Lizards

1. Eastern Collared Lizard

1. Midland Water Snake

2. Prairie Ringneck Snake

3. Eastern Yellow-bellied Racer

4. Eastern Coachwhip

5. Northern Flat-head Snake

6. Western Pygmy Rattlesnake

7. Timber Rattlesnake

TTT Reptiles found only in the Southern Mississippi Valley Alluvium MLRA and the Southern Mississippi Valley Silty Uplands MLRA

#### Turtles

- 1. Mississippi Mud Turtle
- 2. Southern Painted Turtle
- 3. Western Chicken Turtle

### Snakes

- 4. Western Mud Snake
- 5. Southern Black Racer
- 6. Gray Rat Snake
- 7. Scarlet Snake
- 8. Mississippi Ringneck Snake
- 9. Southern Copperhead
- 10. Canebrake Rattlesnake

### Snakes

- 1. Green Water Snake
- 2. Yellow-Bellied Water Snake
- 3. Broad-Banded Water Snake
- 1/ Common names taken from Conant's A Field Guide to Reptiles and Amphibians

#### Appendix table II-12--Permanent resident bird species inhabiting the St. Francis River Basin (a minimum checklist) 1/

#### I Birds found throughout the basin

1.	Wood Duck
2.	Turkey Vulture
3.	Sharp-Shinned Hawk
4.	Cooper's Hawk
5.	Red-Shouldered Hawk
-	- 44 4

6. Sparrow Hawk 7. Bobwhite 8. Wild Turkey 9. Kildeer

10. American Woodcock

11. Rock Dove 12. Mourning Dove 13. Roadrunner

14. Barn Owl 15. Screech Owl 16. Great Horned Owl

17. Barred Owl

18. Belted Kingfisher

19. Yellow-Shafted Flicker 20. Pileated Woodpecker

21. Red-bellied Woodpecker 22. Red-headed Woodpecker

23. Hairy Woodpecker 24. Downy Woodpecker 25. Horned Lark

26. Blue Jay 27. Common Crow 28. Carolina Chickadee

29. Tufted Titmouse 30. White-breasted Nuthatch

31. Bewick's Wren 32. Carolina Wren 33. Mockingbird

34. Brown Thrasher

35. Robin 36. Eastern Bluebird 37. Loggerhead Shrike

38. Starling 39. House Sparrow

40. Eastern Meadowlark 41. Redwinged Blackbird

42. Common Grackle 43. Brown-headed Cowbird

44. Cardinal

45. Rufous-sided Towhee 46. Field Sparrow

Birds found only in the Ozark Highland Major Land Resource Area

1. Bald Eagle

Birds found only in the Southern Mississippi Valley Alluvium MLRA and in the Southern Mississippi Valley Silty Uplands MLRA

1. Long-billed Marsh Wren

2. Short-billed Marsh Wren

3. Pine Warbler

1/ Common names taken from Peterson's A Field Guide to the Birds

### Appendix table II-13--Summer resident bird species inhabiting the St. Francis River Basin (a minimum checklist) 1/

#### I Birds found throughout the basin

1.	Green Heron	12.	Acadain Flycatcher	23.	Red-eyed Vireo
2.	Yellow-crowned Night Heron	13.	Eastern Wood Pewee	24.	Prothonotary Warbler
3.	Yellow-billed Cuckoo	14.	Bank Swallow	25.	Prairie Warbler
4.	Chuck-will's-widow	15.	Rough-winged Swallow	26.	Yellowthroat
5.	Whip-poor-will	16.	Barn Swallow	27.	Yellow-breasted Chat
6.	Nighthawk	17.	Cliff Swallow	38.	Orchard Oriole
7.	Chimney Swift	18.	Purple Martin	29.	Baltimore Oriole
8.	Ruby-throated Hummingbird	19.	Cat Bird	30.	Summer Tanager
9.	Eastern Kingbird	20.	Wood Thrush	31.	Blue Grosbeak
10.	Great Crested Flycatcher	21.	Blue-gray Gnatcatcher	32.	Indigo Bunting
11.	Eastern Phoebe	22.	White-eyed Vireo	33.	Dickcissel
				34.	Grasshopper Sparrow
				35.	Lark Sparrow

#### II Birds found only in the Ozark Highland Major Land Resource Area

1. Black-billed Cuckoo	4.	Yellow Warbler	7.	American	Redstart
2. House Wren	5.	Ovenbird	8.	Chipping	Sparrow
3. Parula Warbler	6.	Louisiana Waterthrush			

#### III Birds found only in the Southern Mississippi Valley Alluvium MLRA and in the Southern Mississippi Valley Silty Uplands MLRA

l. Little Blue Heron	4. Snowy Egret	7. Mississippi Kite
2. Cattle Egret	<ol><li>Black-crowned Night Heron</li></ol>	8. King Rail
3. Common Egret	6. Glossy Ibis	9. Painted Bunting

<sup>1/</sup> Common names taken from Peterson's A Field Guide to the Birds

### Appendix table II-14--Winter resident bird species inhabiting the St. Francis River Basin (a minimum checklist) $\underline{1}/$

#### I Birds found throughout the basin

2. 3. 4. 5.	Canada Goose Red-tailed Hawk Marsh Hawk Herring Gull Yellow-bellied Sapsucker Red-breasted Nuthatch	8. 9. 10. 11.	Brown Creeper Western Meadowlark Rusty Blackbird Evening Grosbeak Red Crossbill Savannah Sparrow	14. 15. 16.	Slate-colored Junco White-crowned Sparrow White-throated Sparrow Fox Sparrow Song Sparrow
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- II Birds found only in the Ozark Highland Major Land Resource Area
  - 1. Pine Warbler
- III Birds found only in the Southern Mississippi Valley Alluvium MLRA and in the Southern Mississippi Valley Silty Uplands MLRA

1. Black Duck	4. Ring-billed Gull	7. American Goldfinch
2. Ruddy Duck	5. Short-eared Owl	8. Swamp Sparrow
<ol><li>Krider's Redtail</li></ol>	6. Winter Wren	9. Smith's Longspur
		10. Snow Bunting

<sup>1/</sup> Common names taken from Peterson's A Field Guide to the Birds

### Appendix table II-15--Transient visitant bird species observed in the St. Francis River Basin (a minimum checklist) $\underline{1}/$

#### I Birds found throughout the basin

1.	Common Loon	33.	Upland Plover	65.	Worn-eating Warbler
2.	Pied-billed Grebe	34.	Spotted Sandpiper	66.	Golden-winged Warbler
3.	Double-crested Cormorant	35.	Solitary Sandpiper	67.	Blue-winged Warbler
4.	Great Blue Heron	36.	Greater Yellowlegs	68.	Tennessee Warbler
5.	American Bittern	37.	Lesser Yellowlegs	69.	Nashville Warbler
6.	White-fronted Goose	38.	Pectoral Sandpiper	70.	Magnolia Warbler
7.	Snow Goose	39.	White-rumped Sandpiper	71.	Myrtle Warbler
8.	Blue Goose	40.	Least Sandpiper	72.	Black-throated Green Warbler
9.	Mallard	41.	Short-billed Dowitcher	73.	Cerulean Warbler
10.	Gadwall	42.	Long-billed Dowitcher	74.	Blackburnian Warbler
11.	Pintail Pintail	43.	Franklin's Gull	75.	Yellow-throated Warbler
12.	Green-winged Teal	44.	Bonaparte's Gull	76.	Chestnut-sided Warbler
13.	Blue-winged Teal	45.	Forster's Tern	77.	Bay-breasted Warbler
14.	American Widgeon	46.	Least Tern	78.	Blackpoll Warbler
15.	Shoveler	47.	Caspian Tern	79.	Palm Warbler
16.	Redhead	48.	Black Tern	80.	Northern Waterthrush
17.	Ring-necked Duck	49.	Least Flycatcher	81.	Mourning Warbler
18.	Canvasback	50.	Tree Swallow	82.	Hooded Warbler
19.	Greater Scaup	51.	Hermit Thrush	83.	Wilson's Warbler
20.	Lesser Scaup	52.	Swainson's Thrush	84.	Canada Warbler
21.	Bufflehead	53.	Gray-cheeked Thrush	85.	Bobolink
22.	Hooded Merganser	54.	Veery	86.	Western Meadowlark
23.	Common Merganser	55.	Golden-crowned Kinglet	87.	Brewer's Blackbird
24.	Red-breasted Merganser	56.	Ruby-crowned Kinglet	88.	Scarlet Tanager
25.	Broad-winged Hawk	57.	Water Pipit	89.	Rose-breasted Grosbeak
26.	Golden Eagle	58.	Cedar Waxwing	90.	Purple Finch
27.	Osprey	59.	Yellow-throated Vireo	91.	Pine Siskin
28.	Virginia Rail	60.	Solitary Vireo	92.	Le Conte's Sparrow
29.	Sora Rail	61.	Warbling Vireo	93.	Henslow's Sparrow
30.	American Coot	62.	Black and White Warbler	94.	Vesper Sparrow
31.	Semipalmated Plover	63.	Swainson's Warbler	95.	Lincoln's Sparrow
32.	Common Snipe	64.	Common Tern		

#### II Birds found only in the Ozark Highland Major Land Resource Area

1. Ruddy Duck

# III Birds found only in the Southern Mississippi Valley Alluvium MLRA and the Southern Mississippi Valley Silty Uplands MLRA

2. Black Duck

Τ.	Horned Grebe	9.	Semipalmated Sandpiper	17.	Ovenbird
2.	Western Grebe	10.	Sanderling	18.	Louisiana Waterthrush
3.	Eared Grebe	11.	American Avocet	19.	Kentucky Warbler
4.	White Pelican	12.	Black-billed Cuckoo	20.	American Redstart
	Bald Eagle	13.	House Wren	21.	Sharp-tailed Sparrow
6.	American Golden Plover	14.	Parula Warbler	22.	Chipping Sparrow
7.	Willet	15.	Yellow Warbler	23.	Lapland Longspur
8.	Stilt Sandpiper	16.	Cape May Warbler		

<sup>1/</sup> Common names taken from Peterson's A Field Guide to the Birds

### Appendix table II-16--Mammal species inhabiting the St. Francis River Basin (a minimum checklist) 1/

#### I Mammals found throughout the basin

- 1. Opossum
- 2. Short-Tailed Shrew
- 3. Least Shrew
- 4. Southeastern Shrew
- 5. Eastern Mole
- 6. Little Brown Bat
- 7. Keen's Myotis
- 8. Gray Myotis
- 9. Indiana Myotis
- 10. Small-footed Myotis
- ll. Silver-Haired Bat
- 12. Eastern Pipistrelle
- 13. Big Brown Bat 14. Red Bat
- 15. Hoary Bat
- 16. Evening Bat
- 17. Rafinesque's Big-Eared Bat
- 18. Swamp Rabbit
- 19. Eastern Cottontail
- 20. Eastern Chipmunk
- 21. Gray Squirrel
- 22. Fox Squirrel
- 23. Southern Flying Squirrel
- 24. Beaver
- 25. Marsh Rice Rat

- 26. Western Harvest Mouse
- 27. Fulvous Harvest Mouse
- 28. Deer Mouse
- 29. White-footed Mouse
- 30. Cotton Mouse
- 31. Golden Mouse
- 32. Cotton Rat
- 33. Eastern Wood Rat
- 34. Prairie Vole 35. Pine Vole
- 36. Muskrat
- 37. Southern Bog Lemming
- 38. Black Rat
- 39. Norway Rat
- 40. House Mouse
- 41. Coyote 42. Red Fox
- 43. Gray Fox
- 44. Raccoon
- 45. Long-Tailed Weasel
- 46. Mink
- 47. Spotted Skunk
- 48. Striped Skunk
- 49. River Otter
- 50. Bobcat 51. White-Tailed Deer
- II Mammals found only in the Ozark Highland Major Land Resource Area
  - 1. Townsend's Big-Eared Bat
  - 2. Meadow Jumping Mouse
  - 3. Brush Mouse

- 4. Black Bear
- 5. Eastern Spotted Skunk
- 6. Panther
- III Mammals found only in the Southern Mississippi Valley MLRA and the Southern Mississippi Valley Silty Uplands MLRA
  - 1. Southeastern Myotis
  - 2. Nine-Banded Armadillo

- 3. Eastern Harvest Mouse
- 4. Plains Pocket Gopher
- 1/ Common names taken from Hall's and Kelson's The Mammals of North America, Vols. I and II

Appendix table II-17--Area of land and forest land St. Francis River Basin, 1969

Land class	Upland site	Bottom-land site	Basin
		1000 Acres	
Land area			5,402.2
Forest land Commercial Non-commercial 1/	696.4 37.2	251. <sup>1</sup> 4 0.0	947.8 37.2
All forest	733.6	251.4	985.0

<sup>1/</sup> Includes unproductive sites and productive reserve.

Appendix table II-18--Area of land and forest land, by states St. Francis River Basin, 1969

Land class	Arkansas	Missouri	Basin
		1000 Acres	
Land area	2,861.2	2,541.0	5,402.2
Forest land Commercial Non-commercial 1/	333•2 •6	614.6 36.6	947.8 37.2
All forest	333.8	651.2	985.0
Commercial forest as a percent of land area	12	24	18

<sup>1/</sup> Includes unproductive sites and productive reserve

Appendix table II-19--Area of commercial forest land by physiographic sites and state St. Francis River Basin, 1969

Physiographic sites	: : Arkansas :	: : : : : : : : : : : : : : : : : : :	Basin
		- 1000 acres	
Bottomland site	202.3	49.1	251.4
Upland site	130.9	565.5	696.4
All sites	333.2	614.6	947.8

#### Appendix table II-20--Area of commercial forest land by ownership class St. Francis River Basin, 1969

Ownership class	: : Arkansas :	: : : : : : : : : : : : : : : : : : :	Basin
		- 1000 acres	
Public:			
National Forest	18.8	99.2	118.0
Other federal	13.0	17.0	30.0
State	34.6	16.4	51.0
	<del> </del>		
Total public	66.4	132.6	199.0
Private:			
Forest industry	11.3	10.2	21.5
Farmer and miscellaneous	255.5	471.8	727.3
m . 1	066.0	400.0	7/0 0
Total private	266.8	482.0	748.8
All ownership	333.2	614.6	947.8
THE OWNEROTTE	333.2	01.10	, , , <b>,</b> o

Appendix table II-21--Area of commercial forest land by stand size classes and state St. Francis River Basin, 1969

Stand size class	: Missouri	: : : : : : : : : : : : : : : : : : :	Basin
		1000 acres	
Sawtimber	197.9	162.7	360.6
Poletimber	279.4	79.9	359.3
Sapling and seedling	115.9	90.6	206.5
Non-stocked	21.4	0.0	21.4
All classes	614.6	333.2	947.8

Appendix table II-22--Area of commercial forest land by productivity class St. Francis River Basin, 1969

Productivity class	: Missouri	: Arkansas	: Basin :
		- 1000 acres	
225 cubic feet or more	0	19.3	19.3
165 - 225 cubic feet	.8	14.7	15.5
120 - 165 cubic feet	3.7	37.2	40.9
85 - 120 cubic feet	39.4	95.5	134.9
50 - 85 cubic feet	159.6	128.0	287.6
20 - 50 cubic feet	411.1	38.5	449.6
All Classes	614.6	333.2	947.8



APPENDIX TABLES - CHAPTER III

Economic Development



Appendix table III-1--Area of land and forest, St. Francis Economic Study Area, year 1969

Land class	-	Area	
Leiki Class	Arkansas :	Missouri	: Study area
		- 1,000 acres	
Land area	4,747.3	4,872.1	9,619.4
Forest land:			
Commercial	656.5	1,712.7	2,369.2
Noncommercial 1/	0.8	68.0	68.8
All forest	657.3	1,780.7	2,438.0
Forest land as a percent of land area	14	37	25

<sup>1/</sup> Includes unproductive sites and productive reserve.

Source: 1969 Arkansas Forest Survey and 1972 Missouri Forest Survey.

Appendix table III-2--Area of commercial forest land by physiographic site, St. Francis Economic Study Area, 1947, 1959, and 1969

					,	Physiogra	Physiographic site		
Year		Forest land	וק	Ø	Bottom land			Upland	
	Arkansas	Arkansas : Missouri :	Total	Arkansas : Missouri : Total	Missouri:	Total	Arkansas	Arkansas : Missouri : Total	Total
	1	1 1	0	-	1,000 acres	0		1	1
1947	1,577.5	2,121.0	3,698.5	1,401.5	411.0	1,812.5	176.0	1,710.0	1,886.0
1959	1,248.2	1,926.4	3,174.6	1,090.2	284.7	1,374.9	158.0	1,641.7	1,799.7
1969	656.5	1,712.7	2,369.2	515.5	198.9	4.417	141.0	1,513.8	1,654.8

1969 Arkansas Forest Survey and 1972 Missouri Forest Survey. Source:

Appendix table III-3--Area of commercial forest land by ownership class, St. Francis Economic Study Area, year 1969

Ownership class		Area	
	Arkansas	: Missouri	: Study area
		1,000 acr	es
Public:			
National Forest	18.8	262.1	280.9
Other Federal	23.2	14.4	37.6
State	32.1	31.6	63.7
Total public	74.1	308.1	382.2
Private:			
Forest industry	46.2	42.7	88.9
Farmer and miscellaneous	536.2	1,361.9	1,898.1
Total private	582.4	1,404.6	1,987.0
All ownership	656.5	1,712.7	2,369.2

Source: 1969 Arkansas Forest Survey and 1972 Missouri Forest Survey.

Appendix table III-4--Area of commercial forest land by forest type, St. Francis Economic Study Area, year 1969

		Area	
Forest type	Arkansas	: Missouri :	Study area
		1,000 acres	
Oak-pine	4.1	117.5	121.6
Oak-hickory	136.9	1,411.7	1,548.6
Oak-gum-cypress	411.8	34.2	446.0
Elm-ash-cottonwood	103.7	89.1	192.8
Nonstocked	0.0	60.2	60.2
All types	656.5	1,712.7	2,369.2

Source: 1969 Arkansas Forest Survey and 1972 Missouri Forest Survey.

Appendix table III-5--Area of commercial forest land by stand-size class, St. Francis Economic Study Area, year 1969

Stand-size class		Area	
Dedita-2176 Caraba	Arkansas	Missouri	: Study area
		- 1,000 acres -	
Sawtimber	320.6	551.4	872.0
Poletimber	157.5	778.6	936.1
Saplings and seedlings	178.4	322.5	500.9
Nonstocked	0.0	60.2	60.2
All class	656.5	1,712.5	2,369.2

Source: 1969 Arkansas Forest Survey and 1972 Missouri Forest Survey.

#### APPENDIX TABLES - CHAPTER IV

Problems and Needs of Water and Related Land Resources



#### Subsurface - Seepage Problems

Ground water and excess surface water have been problems in the basin since it was first used for the production of agricultural crops. Measures were taken to relieve problems of excess surface water and flooding in the early development of the area by constructing elaborate ditch systems. These ditch systems indirectly relieved many of the ground water problems.

Many complaints have been made by land owners and operators of continuing problems of the movement of water below the ground surface. The complaint most frequently made was that high stages in floodways would cause crop damage because of seepage of water under the levees. The high stages in the floodways were higher than natural conditions because the levees restricted the cross-sectional area above the bankfull flow. In some locations, high ground water was attributed to high stages of the Mississippi River.

The complaints resulted in a study by the Soil Conservation Service for the Corps of Engineers to determine the extent, magnitude, and effect of seepage water along the St. Francis floodway. Also, the data would be used to evaluate various alternative methods of reducing the problems. Five pilot areas with differing environmental conditions were selected for the study.

The Rivervale area was north of the confluence of the St. Francis River and Right Hand Chute of Little River. This area had a history of seepage, different kinds of surface soil, and a cropping pattern of soybeans and cotton, and levees on three sides.

The Cardwell area has a relatively thin surface stratum of clay or silt with a small area of exposed sand. The Kennett area was selected to determine the effects of a rapidly permeable soil on the rate of seepage and the effect of a ditch traversing the area on ground water elevations. The Tulot area included a deep ditch which extends through the fine grained surface deposits to the underlying sand. The ditch was serving as an interceptor of seepage water coming under the levee from the St. Francis floodway. The Piggott area has high-silt soils with the levee surrounding two sides of the area.

For a more detailed description and results from this 18-month study refer to St. Francis River Basin Below Wappapello Lake, Missouri and Arkansas, Preliminary Phase Report, (Ground Water Investigation), Department of the Army, Memphis District, Corps of Engineers, Memphis, Tennessee, October 1971.

In the Rivervale area, the piezometric surface generally sloped from the north central part of the area toward the southwest, south, and southeast to about the Poinsett County line. South of the county line, the slope was toward Ditch No. 56 and Ditch No. 4. These slopes are shown on figures 1 and 2 for the peak on April 27, 1970 and the low on August 3, 1970. The piezometric surface fluctuated four to five feet between the peak and the low. The piezometric surface on April 27th was two feet deep in most of the area, one foot deep in areas near the

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levee, and less than half a foot deep in a few places but was from two to seven feet deep in August.

The water tables, as measured by shallow piezometers in the root zone, did not correlate with the piezometric surface measured in the deeper aquifer. The piezometric surface in the sand (20 feet deep) varied with the stages in the floodway while the water table showed very little change.

Crop responses to the water table indicated that two thirds of the crops benefited from the water table. Planting was delayed in onetenth of the area because of surface water ponding. No damages to crops could be definitely attributed to shallow water table because of seepage from the floodways.

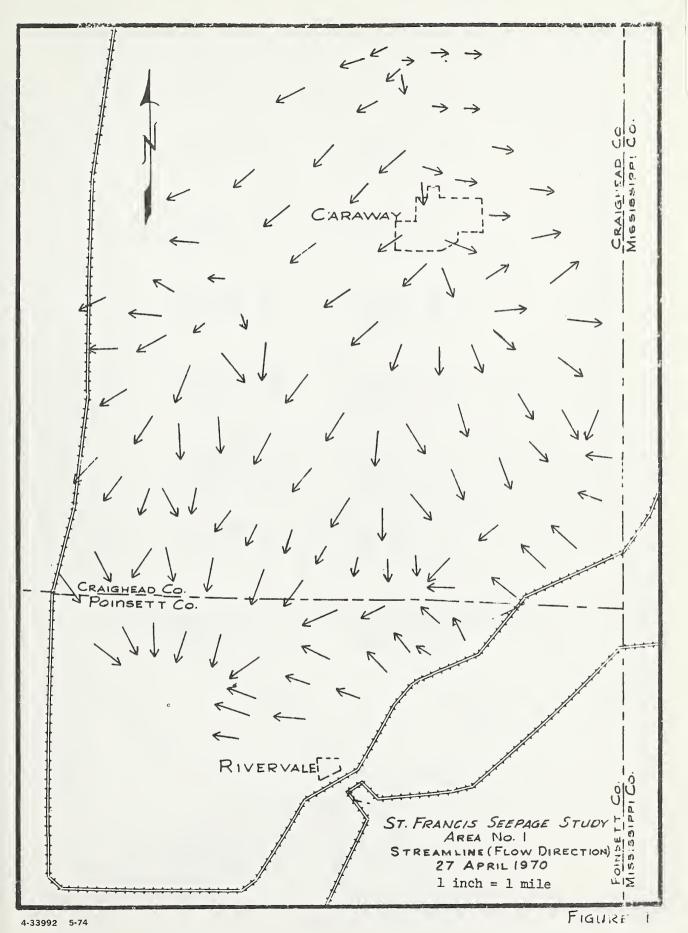
In the Cardwell area, the water sloped toward Red Devil Ditch. The water table benefited crops on 30 percent of the area. About 10 percent of the area received crop damage from ponded surface water but no damage could be attributed to shallow water tables.

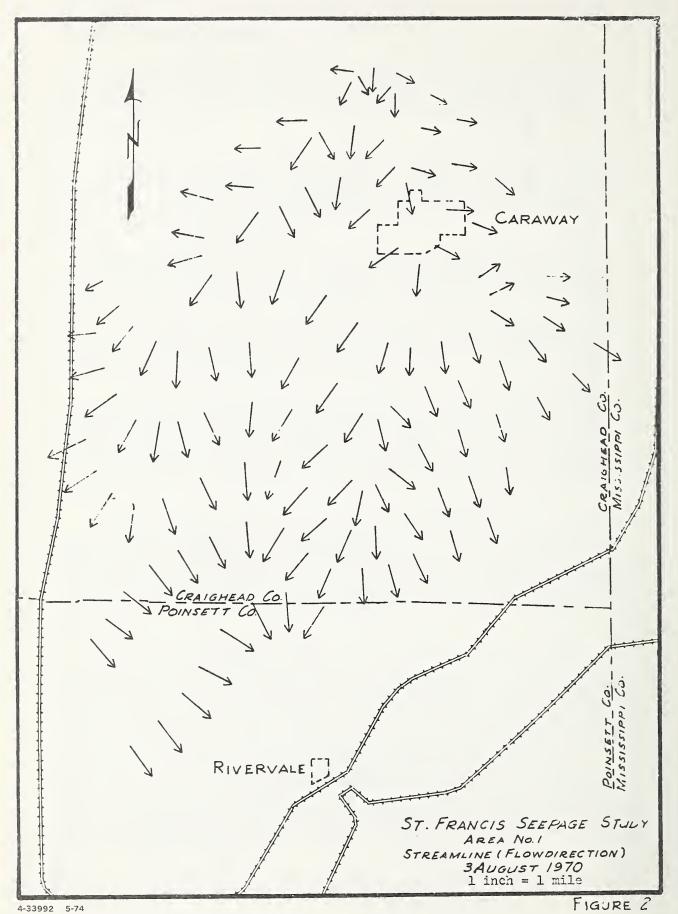
In the Kennett area the water table sloped toward Ditch No. 3. About 30 percent of the area benefited from the water table and 30 percent was damaged by ponded surface water.

The Tulot Ditch appeared to be effective in providing relief of excess ground water. The piezometric surface and water table sloped toward the ditch during both high and low stages in the floodway. Crops benefited by the water table on 30 percent of the area. Surface water was ponded on 30 percent of the area but no damages were observed. A non-detrimental perched water table existed under 10 percent of the area.

In the Piggott area, the piezometric surface was nearly level at any given time; however, it fluctuated about 10 feet between high and low stages in the floodway. Water tables and water levels in drainage ditches did not correlate well with the piezometric surface. Planting was delayed on 40 percent of the area because of either excess rainfall or ponded surface water; however, no damages were caused by shallow water table.

The procedures used in making the observations and collecting the data were highly refined and have a high degree of reliability; however, the time period was only 18 months and included only one growing season. Therefore, the conclusions from this study of seepage problems along the St. Francis do not imply that in years of higher rainfall or higher stages in the floodway that real and significant seepage problems would not occur. Part of the seepage problems occur on slopes where fine textured material is overlain with sand. The sand has high rainfall intake rates and low water-holding capacity, which causes a saturated condition at the clay-sand interface and subsequent seepage. The flow directions of ground water shown in figures 1 and 2 are indicative of this condition which is fairly common in the area and independent of floodway stages.





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Appendix table IV-1--Crop distribution on irrigated land St. Francis River Basin

Crop	: 1969	: 1970	••	1980	••	2000		2020
	. A11	: Wet Soils : Only	A11	: Wet Soils : Only	: : A11	: Wet Soils : Only	A11	Wet Soils Only
	1			Ac	Acres			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Missouri	880	75 570	52 502	767 27	7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	072 07	000	63
Soybeans	33,202	32,811	39,042	38,532	45,850	44,190	47,226	52,987 46,222
Cotton	10,133	9,114	10,133	8,892	10,133	9,700	10,133	9,019
Vegetables	3,123	0	3,279	0	3,607	0	3,968	0
Rice	4,641	3,646	4,641	3,952	4,966	4,311	5,363	4,510
Total	101,187	91,143	109,687	98,800	119,778	107,780	125,288	112,738
:								
Corn	264	0	0		0	0	0	0
Soybeans	96,827	86,435	119,267	106,058	135,824	120,689	149,004	122,811
Cotton Vecetables	27,328	23,361 0	27,328		27,328	23,361	27,328	23,361
Rice	139,581	123,813	139,581	123,813	149,352	132,480	150,547	143,078
Total	264,000	233,609	286,176	253,232	312,504	276,530	326,879	289,250

Appendix table IV-2--Estimated principal use of water by source and counties - 1970 St. Francis River Basin, million gallons per day

								Rural	use			rrigation	
	P	ublic supp	ly	Self s	upplied in	dustry	Domestic		Livestock			Rice	
County	Ground water	Surface water	Total	Ground water	Surface water	Total	Ground water	Ground water	Surface water	Total	Ground water	Surface water	Total
Clay	.48	0	.48	0	0	0	.19	.96	.96	.12	4.77	0	4.77
Craighead	3.72	0	3.72	.72	. 16	.88	1.05	.11	.07	.18	12.63	0	12.63
Crittenden	3.54	0	3.54	.05	0	.05	1.02	.08	.02	.10	27.98	0	27.98
Cross	1.04	0	1.04	1.22	.17	1.39	.70	.14	.03	.17	85.9 <b>9</b>	1.16	87.15
Greene	1.84	0	1.84	.15	0	.15	.60	.13	.09	.22	6.80	0	6.80
Lee	.58	o	.58	0	о	0	. 444	.07	.05	.12	9.88	.29	10.17
(is <b>sissipp</b> i	4.83	0	4.83	6.96	0	6.96	1.13	.10	.03	.13	3.99	2.01	6.00
Phillips	0	0	0	0	0	0	.01	0	.01	.01	0	0	0
Poinsett	1.74	0	1.74	.29	0	.29	.80	.06	.OH	.10	78. his	0	78.44
St. Prancis	1.82	0	1.82	.30	0	.30	.99	.16	.04	.20	41.18	3.19	44.37
loodruff	.03	0	.03	.01	0	.01	.02	.01	.01	.02	2,00	.10	2.10
County totals - Arkansas	19.62	0	19.62	9.70	•33	10.03	6.95	.92	.45	1.37	273.66	6.75	280.41

Appendix table IV-2 (cont.)--Estimated principal use of water by source and counties - 1970 St. Francis River Basin, million gallons per day

		ion (cont		Fish an	d minnow	farms	1	restion a		Pae	l-electric	power	c	ounty tota	1
County	Ground water	Surface water	Total	Ground water	Surface water	Total									
Clay	•55	0	.55	0	0	0	0	0	0	0	0	0	6.05	.06	6.11
Craighead	15.87	0	15.87	.23	.10	•33	0	0	0	0	0	o	34.33	-33	34.66
Crittenden	5.05	0	5.05	.98	.76	1.74	0	0	0	0	0	0	38.70	.78	39.48
Cross	6.63	.77	7.40	2.46	1.34	3.80	0	0	0	0	0	o,	98.18	3.47	101.65
Greene	0	.01	.01	.32	.04	.36	0	0	0	0	0	0	9.84	.14	9.98
Lee	2.43	0	2.43	.04	.24	.28	0	0	0	0	0	0	13.44	.58	14.02
Mississippi	•39	.02	.41	1.19	0	1.19	.01	32.14	32.15	0	0	0	18.60	34.20	52.80
Phillips	0	0	0	0	0	0	0	2.93	2.93	.72	345.20	345.92	<u>1</u> / .73	348.14	348.87
Poinsett	22.16	0	22.16	.80	•93	1.73	0	.14	.14	0	0	0	104.29	1.11	105.40
St. Francis	8.88	.81	9.69	2.26	1.30	3.56	0	0	0	. 38	.90	1.28	55 <b>.9</b> 7	6.24	62.21
Woodruff	.08	0	.08	.30	.17	.47	0	0	0	0	0	0	2.45	.28	2.73
County totals - Arkensas	62.04	1.61	63.65	8.58	4.88	13.46	.01	35.21	35.22	1.10	346.10	347.20	382.58	395 - 33	777.91

 $<sup>\</sup>underline{1}\!/$  Withdrawal is from the Mississippi River outside the basin boundary.

Appendix table IV-2 (cont.)--Estimated principal use of water by source and counties - 1970 St. Francis River Basin, million gallons per day

				T				Rural	use		7	rrigation	
	P	ablic supp	oly	Self s	upplied in	ndustry	Domestic		Livestock			Rice	
County	Ground water	Surface water	Total	Ground water	Surface water	Total	Ground water	Ground water	Surface water	Total	Ground water	Surface water	Total
Bollinger	.01	0	.01	0	0	0	.04	.01	.03	.04	0	0	0
Butler	0	0	э	0	0	0	.01	0	.01	.01	0	0	0
Cape Girardcau	.03	0	.03	0	0	0	.08	0	.01	.01	0	0	0
Dunklin	1.78	0	1.78	.06	0	.06	.56	.03	.07	.10	o	0	0
Iron	.29	0	.29	10.90	0	10.90	.16	.01	.05	.06	0	0	0
Madison	.29	0	.29	0	0	0	.10	.02	.11	.13	0	0	0
New Madrid	.94	0	.94	0	o	0	-34	.02	.06	.08	.25	.03	.28
Pemiscot	1.97	0	1.97	o	0	0	.40	.01	.03	.04	3.00	-33	3.33
St. Francois	1.22	0	1.22	23.50	0	23.50	.24	.02.	.10	.12	0	0	0
Ste. Genevieve	.03	0	.03	0	0	0	.02	0	.02	.02	0	0	0
Scott	1.00	0	1.00	0	0	0	.19	.04	.10	.14	.60	.07	.67
Stoddard	1.23	0	1.23	-37	0	•37	.66	.11	.32	.43	4.54	.50	5.04
Wayne	.23	0	.23	0	0	0	.17	.01	.10	.11	0	0	0
County totals - Missouri	9.02	0	9.02	34.83	0	34.83	2.97	.28	1.01	1.29	8.39	.93	9.32
Basin totals -	28.64	0	28.64	LH . 53	.33	44.86	9.92	1.20	1.46	2.66	282.05	7.68	289.73
Basin totals - Ac.Ft./Yr.	32,077	0	32,077	49,873	370	50,243	11,110	1,344	1,635	2,979	315,896	8,602	324,498

#### Appendix table IV-2 (cont.)--Estimated principal use of water by source and counties - 1970 St. Francis River Basin, million gallons per day

	Irrigat	ion (con	tinued)	_			Rec	reation	and	1					
		her crop		7	d minnow			fe impou			l-electric	power		County tot	
County	Ground water	Surface water	Total	Ground water	Surface water	Total	Ground water	Surface water	Total	Ground water	Surface water	Total	Ground water	Surface water	Total
Bollinger	.02	0	.02	.08	.04	.12	o	1.42	1.42	0	o	o	.16	1.49	1.65
Detler	0	0	0	.58	.29	.87	0	.01	.01	0	0	0	-59	.31	.90
Cape Girardeau	0	0	0	.08	.04	.12	0	2,98	2.98	0	0	0	.19	3.03	3.22
Dunklin	6.08	.67	6.75	.08	.04	.12	.02	2.46	2.48	0	7.02	7.02	8.61	10.26	18.87
Iron	o	0	0	0	0	0	0	1.22	1.22	0	0 _	0	11.36	1.27	12.63
indison	0	. 0	0	0	0	0	0	1.39	1.39	0	0	0	.41	1.50	1.91
low Madrid	8.45	.94	9.39	0	0	0	0	0	0	0	0	0	10.00	1.03	11.03
Pemiscot	1.34	.15	1.49	.08	.04	.12	0	•55	•55	0	0	0	6.80	1.10	7.90
St. Francois	0	0	0	0	0	0	0	2.68	2.68	0	0	0	24.98	2.78	27.76
Ste. Genevieve	0	0	0	0	0	0	0	.38	.38	0	o	0	.05	40	.45
leott	4.60	.50	5.10	0	0	0	0	.28	.28	0	0	0	6.43	-95	7.39
toddard	14.54	1.62	16.16	.58	.29	.87	.02	2.09	2.11	0	0	0	22.05	4.82	26.87
layne	0	0	0	.08	.04	.12	0	148.56	148.56	0	0	0	.49	148.70	149.19
County totals -	35.03	3.88	38.91	1.56	.78	2.34	.04	164.02	164.06	. 0	7.02	7.02	92.12	177.64	269.76
msin totals - mgd	97.07	5.49	102.56	10.14	5.66	15.80	.05	199.23	199.28	1.10	353.12	354.22	474.70	572.97	1,047.67
Ac.Ft./Yr.	108,718	6,149 1	14,867	11,357	6,339	17,696	56	223,138	223,194	1,232	395,494	396,726	531,664		1,173,390

Appendix table IV-3--Estimated water needs by time periods, principal use and source, St. Francis River Basin, million gallons per day  $\frac{1}{2}$ 

								Rural use	use		1	Irrigation	
	<u> </u>	Public supply	Ż	Self su	Self supplied industry		Domestic		Livestock			Rice 2/	
Year	Ground	Surface	Total	Ground	Surface		Ground	Ground	Surface	Total	Ground	Surface	Total
1970 3/	28.64		28.64	44.53	.33	98.44	9.92	1.20	1.46	2.66	282.05	7.68	289.73
1980	32.94		32.94	55.66	14.	56.07	9.95	1.24	1.50	2.74	282.05	7.68	289.73
2000	41.18		41.18	62.99	64.	67.28	9.92	1.28	1.55	2.83	301.78	8.24	310.02
2020	48.18		48.18	80.15	.59	47.08	9.92	1.32	1.60	2.92	304.85	8.36	313.21

Appendix table IV-3 (cont.)--Estimated water needs by time periods, principal use and source, St. Francis River Basin, million gallons per day  $\frac{1}{2}$ 

	Irrigat	Irrigation (continued) Other crops	tinued)	Fish and	and minnow ferms	ferms	Reci Wildlii	Recreation and Wildlife impoundments	nd Iments	Fuel	Fuel-electric power	power	Ä	Basin totals	, so
Year	Ground	Ground Surface	Total	Ground Surface	Surface	Total	Ground	Surface Ground Surface water Total		Ground	Ground Surface	Total	Ground Surface	Ground Surface	Total
1970 3/	1970 3/ 97.07	}	5.49 102.56	10.14	5.66	5.66 15.80	•05	199.23 199.28	199.28	1.10	353.12	354.22	02.424	354.22 474.70 572.97	1,047.67
1980	110.98	6.17	21.711	15.62	8.71	8.71 24.33	90.	231.34 231.40	231.40	1,41	1,201.25	1,201.25 4/1,202.66 509.88 1,457.06	509.88	1,457.06	1,966.94
2000	122.47		6.78 129.25	21.50	% हैं	33.50	%	229.02	229.08	3.52	2,997.11	3,000.63 568.50 3,255.19	568.50	3,255.19	3,823.69
2020	130.26		7.14 137.40	33.56	18.74	52.30	90°	240.59	240.65	4.36	3,716.42	3,720.78 612.66 3,993.44	612.66	3,993.44	4,606.10

1/ To convert million gallons per day to acre-feet per year, multiply tabular values by 1,120 for individual years.

2/ Future needs based on "with development" acres.

3/ 1970 water use based on U.S.G.S. and other available data.

4/ The 1,200 megawatt installations planned at New Madrid, Mo. by 1980 represent 63 percent of the amount. The 63 percent amount will be withdrawn from the Mississippi River, adjacent to but outside the St. Francis River Basin.

Counties and cities	Population	Ownership	Source
Clay County			
Patterson	417	Municipal	McCrory Supply
Piggott	3,089	Municipal	Wells
Rector	1,990	Municipal	Wells
St. Francis	297	Municipal	Wells
Greenway	240	Municipal	Wells
Craighead County			
Bay	751	Municipal	Wells
Black Oaks	272	Municipal	Wells
Brookland	465	Municipal	Wells
Caraway	952	Municipal	Wells
Farville	350	Association	Wells
Jonesboro	27,050	Municipal	Wells
Lake City	948	Municipal	Wells
Lake View	200	Association	Wells
Monette	1,076	Municipal	Wells
Crittenden County			
Crawfordsville	831	Municipal	Wells
Earle	3,146	Municipal	Wells
Gilmore	461	Municipal	Wells
Heafer-Black Oak	300	Ass. Tryonza Supply	Wells
Marion	1,634	Municipal	Wells
Turrell	783	Municipal	Wells
West Memphis	25,892	Municipal	Wells
Cross County			
Cherry Valley	556	Municipal	Well
Hickory Ridge	410	Municipal	Well
Parkin	1,731	Municipal	Wells
Wynne	6,696	Municipal	Wells
Greene County			
Center Hill	1,201	Municipal	Paragould Supply
Marmaduke	821	Municipal	Wells
Paragould	10,639	Municipal	Wells
ee County			
Marianna	6,196	Municipal	Wells
Mississippi County			
Armorel	150	Private	Well
Bassett	265	Municipal	Well
Blytheville	24,752	Blytheville Water Company	Wells
Burdett	173	Association	Wells
Dell	358	Municipal	Well
Dogwood	300	Association	Well
Dyess	433	Association	Well
Gosnell	1,386	Association	Well
Grider-Driver	350	Association Association	
Joiner	839		Osceola Supply
		Municipal	Wells
Keiser	688	Municipal	Well
Leachville	1,582	Municipal	Wells
Little River	400	Association	Well
Luxora	1,566	Municipal .	Well
Manila	1,961	Municipal	Wells
Osceola	7,204	Municipal	Wells
	160	Association	
West Ridge		1155001401011	
West Ridge Wilson	1,009	Association	Wells

### Appendix table IV-4 (cont.)--Public water supplies, cities and towns with population over 100 (Arkansas), St. Francis River Basin

Counties and cities	Population	Ownership	Source
Phillips County			
Helena	10,415	Municipal	Wells
St. Francis County			
Caldwell	292	Municipal	Forrest City Supply
Forrest City	12,521	Municipal	Wells
Hughes	1,872	Municipal	Wells
Madison	984	Municipal	Forrest City Supply
Widener	292	Municipal	Forrest City Supply
Poinsett County			
Black Oak	272	Municipal	Wells
Fisher	361	Municipal	Well
Harrisburg	1,931	Municipal	Wells
Lepanto	1,846	Municipal	Wells
Marked Tree	3,208	Municipal	Wells
Payneway	190	Association	Well
Trumann	5,938	Municipal	Wells
Tyronza	510	Municipal	Wells
Weiner	715	Municipal	Well

## Appendix table IV-4 (cont.)--Public water supplies, cities and towns with population over 100 (Missouri), St. Francis River Basin

Counties and cities	Population	Source
Stoddard County		
Advance City	903	Well
Bell City	424	Well
Bernie	1,641	Wells
Bloomfield	1,584	Wells
Dexter	6,024	Wells
Dudley	248	Well
Essex	1,040	Well
Grayridge	250	Well
Puxico	759	Wells
Dunklin County		
Arbyrd	575	Well
Campbell	1,979	Wells
Cardwell	886	Well
Clarkton	1,177	Wells
Holcomb	593	Well
Hornersville	693	Well
Kennett	9,852	Wells
Malden	5 <b>,</b> 37 <sup>4</sup>	Wells
Senath	1,484	Well
Scott County		
Benton	640	Wells
Chaffee	2,793	Wells
Kelso	401	Wells
Miner	640	Well
Morley	528	Well
Oran	1,226	Wells
Scott City	2,464	Wells
Sikeston	14,690	Wells
Vanduser	306	Wells
Iron County		
Annapolis	330	Well
Arcadia	627	Wells
Ironton	1,452	Surface Water
Pilot Knob	582	Surface Water
Medrid County		
Gideon	1,112	Wells
Howardville	500	Well
Lilbourn	1,152	Wells
Marston	666	We <u>ll</u>
Matthews	538	Well.
Morehouse	1,332	Well
New Madrid	2,719	Wells
North Lilbourn	334	Well
Parma	1,051	Wells
Point Pleasant	115	Well
Portageville	3,113	Wells
Risco	412	Wells

## Appendix table IV-4 (cont.)--Public water supplies, cities and towns with population over 100 (Missouri), St. Francis River Basin

Counties and cities	Population	Source
Pemiscot County		
Braggadocio	400	Well
Bragg City	210	Well
Caruthersville	7,350	Well
Cooter	414	Well
Deering	138	Well.
Hayti	3,841	Wells
Holland	329	Well
Pascula	180	Wells
Homestown	273	Well
Steele	2,107	Well
Wardell	275	Well
t. Francois County		
Bismarck	1,387	Wells
Farmington	6,590	Wells
ape Girardeau County		
Delta	462	Well
Madison County		
Fredericktown	3,799	Surface Water
ayne County		
Greenville	321	Well

Appendix table IV-5--Availability of sewage treatment plants by counties in towns with population over 100 (Missouri), St. Francis River Basin

Location	Population	Sewage Treatment Available
Stoddard County		
Advance	903	Yes
Baker	(114)	No
Bell City	424	Yes
Bernie Bloomfield	1,641	Yes
Brownwood	1,584 (250)	Yes No
Dexter	6,024	Yes
Dudley	248	No
Essex	1,040	No
Grayridge	(250)	No
Puxico	<b>`7</b> 59	Yes
Cape Girardeau County		
Delta	462	No
Randles	(169)	No
Iron County		
Annapolis	330	Yes
Arcadia	627	Yes
Des Arc	222 (400)	No
Glover Graniteville	(400)	No No
Ironton	1,452	Yes
Pilot Knob	582	No
Madison County		
Cobalt City Village	228	No
Fredericktown	3 <b>,7</b> 99	Yes
Junction City	166	No
Mine La Motte	(120)	No
New Madrid County		
Catron Gideon	122 1,112	No
Howardville	500	Yes No
Lilbourn	1,152	Yes
Matthews	538	No
Marston	666	No
Morehouse	1,332	Yes
New Madrid	2,719	Yes
North Lilbourn	33 <sup>1</sup> 4	No
Parma ·	1,051	Yes
Point Pleasant	(115)	No
Portageville Risco	3 <b>,11</b> 7 412	Yes No
Wayne County		
Greenville	328	No
Patterson	(145)	No

Appendix table IV-5 (cont.)--Availability of sewage treatment plants by counties in towns with population over 100 (Missouri), St. Francis River Basin

Location	Population	Sewage Treatment Available
Pemiscot County		
Bragg City	(210)	No
Braggadocio	(400)	No
Carthesville	7,350	Yes
Cooter	414	No
Deering	(138)	No
Hayti	3,841	Yes
Holland	329	No
Homestown	(273)	No
Pascola	180	No
Steele	2,107	Yes
Wardell	(275)	No
St. Francois County		
Bismarck	1,387	Yes
Doe Run	(800)	No
Farmington	6,590	Yes
Iron Mountain	(300)	No
Knob Lick	(150)	No
Scott County		
Benton	640	Yes
Chaffee	2,793	Yes
Haywood City	(420)	No
Kelso	401	No
Morley	<b>(</b> 528 <b>)</b>	No
Minor	640	No
New Hamburg	(185)	No
Oran	1,226	Yes
Scott City	2,464	Yes
Sikeston	14,690	Ýes
Vanduser	306	No
Dunklin County		
Arbyrd	575	No
Campbell	1,979	Yes
Clarkton	1,177	No
Cordwell	(859)	No
Holcomb	593	No
Hornerville	693	Yes
Kennett	9,852	Yes
Malden	5 <b>,3</b> 74	Yes
Rives	(120)	No
Senath	1,484	Yes

Note: Populations in parenthesis were taken from 1970 Missouri road map - other came from 1970 census.

Location	Population	Sewage Treatment Available
clay County		
Patterson	417	No
Piggott	3,087	Yes
Rector	1,990	Yes
St. Francis	297	No
Greenway	240	No
raighead County		
Para	751	Yes
Bay Black Oaks	751 272	No
Brookland	465	No
Caraway	952	Yes
Farville	350	No
Jonesboro	27,050	Yes
Lake City	948	Yes
Lakeview	200	No
Monette	1,076	Yes
rittenden County		
Crawfordsville	831	Yes
Earle	3,146	Yes
Gilmore	461	No
Heafer-Black Oak	300	No
Marion	1,634	Yes
Turrell	783	Yes
West Memphis	25,892	Yes
ross County		
Cherry Valley	556	Yes
Hickory Ridge	410	Yes
Parkin	1,731	Yes
Wynne	6,696	Yes
reene County		
G	1 001	Nr.
Center Hill Marmaduke	1,201 821	No Yes
Paragould	10,639	Yes
ee County	, 57	
Marianna	6,196	Yes
dississippi County		
Armorel	150	No
Bassett	265	No
Blytheville	24,752	Yes
Burdett	173	No
Dell	358	No
Dogwood	300	No
Dyess	433	No
Gosnell	1,386	No
Grider-Driver	350	No
Yarbro	300	No
Joiner	839	Yes
Keiser	688	No
Leachville Little River	1,582	Yes
	400	No
Luxora Manila	1,566 1,961	Yes
Osceola	7,204	Yes Yes
	160	les No
West Ridge		

Appendix table IV-6 (cont.)--Availability of sewage treatment plants by counties in towns with population over 100 (Arkansas), St. Francis River Basin

Location	Population	Sewage Treatment Available
Phillips County		
Helena	10,415	Yes
St. Francis County		
Caldwell Forrest City Hughes Madison Widener	292 12,521 1,872 984 292	No Yes Yes Yes No
Poinsett County		
Black Oak Fisher Harrisburg Lepanto Marked Tree Payneway Trumann Tyronza Weiner	272 361 1,931 1,846 3,208 190 5,938 510 715	No Yes Yes Yes No Yes Yes Yes

# Pollution Survey Report Arkansas Pollution Control Commission St. Francis River Basin, 1965 to 1968 Summary and Conclusions

The results of this survey show the possible sources of water pollution in the St. Francis River Basin, their effects on the receiving streams and some background data which may be used for future pollution control activities. The data obtained, especially those from municipalities and industries without adequate waste treatment facilities, indicate the sources where abatement measures are needed to control effectively water pollution of surface streams.

At the time of the survey there were thirty known significant sources of domestic wastes from the cities and installations located within the St. Francis River Basin. Of these sources the following cities or places have secondary waste treatment facilities: Bay, Blytheville, Agrico Chemical Company, Blytheville Air Force Base, Caraway, Forrest City, Harrisburg, Jonesboro, Lake City, Lepanto, Manila, Marked Tree, Paragould, Piggott, Rector, Trumann, Tyronza, and Wynne. The cities with primary sewage treatment plants are Marianna, Marion, Monette and Parkin. The cities of Hughes, Leach-ville and Marmaduke have inadequate sewage treatment plants which were being bypassed while the cities of Helena, Luxora, Osceola, West Memphis and Wilson have no treatment facilities and are discharging untreated sewage directly into the receiving streams.

In addition there are twelve sources of industrial wastes which were investigated and sampled during this survey. Of these sources three discharge directly into the Mississippi River, two have waste treatment facilities under construction, one disposes most of its effluent into the city sewer while six have no waste treatment facilities. The industries surveyed were Agrico Chemical Company at Blytheville, Arkansas Grain Corporation at Helena, Blytheville Canning Company at Blytheville, Carroll Packing Plant at Paragould, Colson Company at Jonesboro, Crane Company at Jonesboro, Douglas Lomason Company at Marianna, L. A. Darling Company at Paragould, Nat Buring Packing Plant at Wilson, Paymaster Oil Company at Osceola, Poinsett Lumber Manufacturing Company at Trumann, and Randall Company at Blytheville.

Localized water pollution of drainage streams was found generally below large centers of population such as Paragould, Blytheville, Jonesboro, Harrisburg, Wynne, Forrest City and Marianna. The streams affected by discharges from municipal sewage treatment plants and industrial sources are Eight Mile Ditch, Pemiscot Bayou, Whiteman Ditch, Ten Mile Bayou, and Crow Creek. The effects, however, were limited in extent. Asher Ditch was not receiving any effluent from the Caraway oxidation pond but survey results indicated some degree of pollution as shown by dissolved oxygen of 2.7 ppm and coliform counts exceeding 5000 per 100 ml. This would be due to the presence of some solid wastes and scrap material on the bank of the stream. Streams with adequate flows for dilution, such as Big Slough Ditch, Right Hand Chute of Little River, Left Hand Chute of Little River, L'Anguille

River, and St. Francis River showed no significant changes in their water quality beyond the immediate vicinities of the outfalls of the sources of pollution.

Streams - All the discharges from the foregoing sources, both municipal and industrial, finally flow into the St. Francis River which receives the drainage of the entire basin. The biological analysis of water samples from this stream showed high coliform bacteria count in the vicinity of Parkin due to direct discharge of the effluent from the primary sewage treatment plant of this city. This count which was in excess of 5000 per 100 ml shows that the stream is adversely affected by this particular discharge and measures for its abatement are necessary. The chemical water quality tests also showed an increased level of nitrates and of turbidity caused apparently by the extensive agricultural areas draining into this stream. Due to some dilution flow coming from the different tributaries no other significant changes have been found in the water quality of this stream after it enters and before it leaves the State.

Big Slough Ditch receives surface runoffs and final discharges from the sewage treatment plants at Piggott, Rector and Marmaduke. This survey showed no significant adverse effects from these pollution sources and this stream has good water quality before it flows into St. Francis River.

Eight Mile Ditch carries the effluents from the sewage treatment plants and industries in Paragould as well as drainage from surrounding areas including Center Hill which had no adequate sewage disposal system. This stream showed some pollution effects due to these sources as indicated by a coliform bacteria count of more than 10,000 per 100 ml, and some concentrations of nickel, zinc, chromium and copper at a sampling station above its confluence with St. Francis River.

The Left Hand Chute of Little River receives the final waste discharges from municipal and industrial sources located in Blytheville and in Lepanto. Below the outfalls the stream showed heavy pollution effects. However, because of the large drainage area and dilution afforded by its tributaries the survey results show that the effects are mostly dissipated before this stream enters the St. Francis River.

The Right Hand Chute of Little River receives no discharges from any significant source of pollution. Except for some turbidity it has fair water quality.

Whiteman Ditch, Gum Slough Ditch, Little Bay Ditch and Big Bay Ditch which finally flow into drainage <u>Ditch No. 10</u> and <u>Ditch No. 104</u> receive the municipal and industrial waste discharges from Jonesboro, Bay and Trumann. Below these outfalls the receiving streams showed some adverse pollution effects. The main sources of pollution for these streams are the run-down Nettleton sewage treatment plant and the untreated wastes from Colson Company, Crane Company and Poinsett Wood Manufacturing Company.

L'Anguille River carries the final effluents and drainage from the cities of Harrisburg, Wynne, Forrest City and Marianna. The pollution effects from these sources were limited in extent to the immediate vicinity of the outfalls. This stream has fair water quality.

In the smaller streams the pollution effects are localized. Municipal wastes are causing varying degrees of oxygen depletion and increased coliform bacteria count below the outfalls, but this condition is not far-reaching in any case.

In general, the results of biologic examination of the waters in the receiving streams show the extent of pollution by sewage or industrial wastes. In most cases results indicate that there is some degree of self-purification of the streams. The comparisons of the different types of both plankton and benthos organisms reflect the biological water quality as affected by the different sources of pollution in the St. Francis River Basin. Some relatively high coliform bacteria counts were obtained below outfalls of primary sewage treatment plants or where treatment plants were being by-passed. Furthermore, untreated toxic industrial wastes, such as those from the metal plating plants in Blytheville, Paragould and Jonesboro changed the biological productivity of the streams in these areas.

Appendix table IV-7--Resources and/or facilities required to meet selected recreational needs in the St. Francis River Basin, Missouri portion, for 1970, and projected 1980 and 1990 1/

	Resource and/or		Year	
Activity	facility	1970	1980	1990
Bike trails	Miles	530	520	530
Horse trails	Miles	7	6	4
Games	Acres	620	720	830
Fishing	Acres	7,900	7,900	7,900
Boating	Acres	3	2	2
Sailing	Acres	0	0	0
Swimming	Sq.ft.	8,900	5,300	4,800
Hunting	Acres	26,700	22,000	18,200
Camping	Acres	5	4	3
Hik <b>i</b> ng	Miles	82	79	76
Picnic	Acres	1	1	1
Winter sports	Acres	26	22	20

 $<sup>\</sup>underline{\underline{l}}/$  Based on State of Missouri Outdoor Recreation Plan, Volume II, Part D, Minimum County Need and Minimum Additional Regional Need.

Appendix table IV-8--Resources and/or facilities required to meet selected recreational needs in the St. Francis River Basin, Arkansas portion, for 1970, and projected 1980, 1990, and 2000 1/2

	Facility		Ye	ear	
Activity	and/or resource	1970	1980	1990	2000
Swimming	Pool (sq.ft.) Beach (sq.ft.)	595,000 2,237,000	847,000 3,225,000	1,091,000 4,153,000	1,386,000 5,268,000
Water sports	Acres	-	23	3,100	6,700
Boating	Docks Parking spaces	5,800 2,200	8,100 3,600	10,400 4,900	13,100 6,500
Horseback riding	Miles	570	780	950	1,200
Outdoor games	Acres	1,800	2,700	3,700	4,800
Golf	9-hole 18-hole	6 2	13 3	17 5	23 7
Tennis	Courts	81	130	180	230
Picnic	Acres	1,100	1,600	2,100	2,600
Camping a. Tent b. Trailer	Acres Acres	210 440	310 610	410 <b>7</b> 70	530 960
Pleasure driving	Miles	690	1,000	1,300	1,700
Hunting a. Small game b. Big game c. Waterfowl	Acres Acres Acres	7,655,000 4,149,000 3,360,000	10,496,000 5,680,000 4,613,000	13,203,000 7,136,000 5,806,000	16,472,000 8,895,000 7,245,000
Warm water fishing	Acres	61,000	97,000	131,000	173,000

<sup>1/</sup> Based on Arkansas Statewide Comprehensive Outdoor Recreation Plan, Statistical Summary, Regional Demand, Supply, and Comparisons, 1968.

Appendix table IV-9--Total irrigation practices by counties in St. Francis River Basin Applied through 1970 (Adjusted from annual 99 report)  $\underline{1}/$ 

					Arkans	Arkansas Counties						
Item	Unit	Unit Mississippi	Craighead	Iee	Poinsett	Crittenden	St. Francis Greene	Greene	Clay	Woodruff	Cross	Totals
Wells Irrig. stg. reservoirs Irrig. systems-sprinkler Irrig. systems-sur. & sub. Irrig. water mgt. Drainage land grading	No. No. Ac.	212 8 64 207 7,441 22,154	200 10 6 200 16,000	78 3 68 11,900		54, 4, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,	556 31 29 715 39,140 4,	97 3 4,080 4,080	32 97 6 37 1,500	34 10 00 50 4,400	887 76 12 900 60,200	2,817 319 156 3,000 249,661 36,112
Irrig. land leveling Irrig. pipelines Irrig. field ditch	Ac. Ft.	28,951 11,661 92,228	7,000 1,000 300,000	181 8,672 168,500	11,000 65,000 60 <b>0,</b> 000	6,424 11,706 806,060	2,265 67,386 1,990,000	2,211 4,070 109,000	3,240 0 80,105	-	6,467 70,473 ,360,200	67,839 254,908 5,631,893

				Missouri	Missouri Counties				
Item	Unit	New Madrid	Stoddard Scott		Dunklin	Pemiscot	Bollinger	Cape Girardeau	Totals
Wells		617	656	टाहें	009	126	128	0	2,742
Irrig. systems-sprinkler		50	27	7	140	25	0	0	243
Irrig. systems-sur. & sub.		360	689	149	560	75	0	0	1,533
Irrig. water mgt.		25,172	28,175	3,254	31,000	5,644	0	0	90,245
Drainage land grading		620,21	15,120	1,274	7,780	3,035	96	17	39,369
Irrig. land leveling	Ac.	33,889	31,047	10,766	7,000	11,718	217	34	91,671
Irrig. pipelines		0	2,600	0	0	0	0	0	2,600
Irrig. field ditch		67,230	221,230	0	0	3,550	0	0	292,010

1/ Contacted D.C.'s in counties and got their estimate on amount of practices in St. Francis River Basin.

Appendix table IV-10--Estimated irrigated water usage in the basin, 1970 St. Francis River Basin

Ground Water 4.77 12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18 2.00	Rice : Surface : Water  0 0 0 1.16 0 .29 2.01 0 0	: Total million 4.77 12.63 27.98 87.15 6.80 10.17 6.00	rrigation: : Ground: : Water gallons pe  .55 15.87 5.05 6.63 0 2.43 .39	0 0 0 .77 .01		5.32 28.50 33.03
4.77 12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	: Surface : Water 0 0 0 1.16 0 .29 2.01	: Totalmillion  4.77 12.63 27.98 87.15 6.80 10.17 6.00	: Ground : Water gallons pe .55 15.87 5.05 6.63 0 2.43	: Surface : Water r day 0 0 0 .77 .01	: : Total .55 15.87 5.05	5.32 28.50 33.00
4.77 12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 0 0 0 1.16 0 .29 2.01	: Totalmillion  4.77 12.63 27.98 87.15 6.80 10.17 6.00	: Water gallons pe  .55 15.87 5.05 6.63 0 2.43	: Water r day 0 0 0 .77 .01	: Total .55 15.87 5.05	5.32 28.50 33.00
4.77 12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 0 0 1.16 0 .29 2.01	4.77 12.63 27.98 87.15 6.80 10.17 6.00	9allons pe .55 15.87 5.05 6.63 0 2.43	0 0 0 0 .77 .01	.55 15.87 5.05	5.32 28.50 33.03
12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 0 1.16 0 .29 2.01	4.77 12.63 27.98 87.15 6.80 10.17 6.00	.55 15.87 5.05 6.63 0 2.43	0 0 0 .77 .01	15.87 5.05	28.50 33.03
12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 0 1.16 0 .29 2.01	12.63 27.98 87.15 6.80 10.17 6.00	15.87 5.05 6.63 0 2.43	0 0 .77 .01	15.87 5.05	28.50 33.03
12.63 27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 0 1.16 0 .29 2.01	12.63 27.98 87.15 6.80 10.17 6.00	15.87 5.05 6.63 0 2.43	0 0 .77 .01	15.87 5.05	28.50 33.03
27.98 85.99 6.80 9.88 3.99 0 78.44 41.18	0 1.16 0 .29 2.01	27.98 87.15 6.80 10.17 6.00	5.05 6.63 0 2.43	0 .77 .01	5.05	33.03
85.99 6.80 9.88 3.99 0 78.44 41.18	1.16 0 .29 2.01	87.15 6.80 10.17 6.00	6.63 0 2.43	.77 .01		
6.80 9.88 3.99 0 78.44 41.18	0 .29 2.01 0	6.80 10.17 6.00	0 2.43	.01	7.40	
9.88 3.99 0 78.44 41.18	.29 2.01 0	10.17 6.00	2.43			94.55
3.99 0 78.44 41.18	2.01 0	6.00			.01	6.81
0 78.44 41.18	0		30	0	2.43	12.60
78.44 41.18				.02	.41	6.41
41.18	^	0	0	0	0	0
	-	78.44	22.16	0	.22.16	100.60
2.00	3.19	44.37	8.88	.81	9.69	54.06
4.00	.10	2.10	.08	0	.08	2.18
				,		
273.66	6.75	280.41	62.04	1.61	63.65	344.06
0	0	0	.02	0	.02	.02
_	_					.00
		_	_	_	_	.00
-	-	_		-	_	6.75
	_	_				.00
-	-	-	_		_	.00
J	J	-	_	-	_	9.67
-						4.82
• • • •			_		-	.00
-	_		-	_		.00
-	J	-		_	_	
		•				5.77
						21.20
0	0	0	0	Ü	0	.00
8.39	.93	9.32	35.03	3.88	38.91	48.23
282.05	7.68	289.73	97.07	5.49	102.56	392.29
		324,498	108,718			
	0 0 0 0 0 0 .25 3.00 0 .60 4.54 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 .02 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 00 0 00 00 0 0 0 0 0 0 0 0 0 0

Appendix table IV-ll--Present and future land treatments under alternative plans St. Francis River Basin

12,266 111,343 3,036 2,189 46,233 121,016 124,583 81,500 108,734 194,891
19. rasture and nayland mgt. 20. Critical area planting 21. Wildlife wetland habitat mgt. 22. Wildlife upland habitat mgt. 23. Tree planting - critical 24. Forest improvement and protection 32. Acres 33. Acres 34. Forest improvement and protection 35. Acres 36. Acres 37. Acres 38. Acres 39. Acres 39. Acres

Appendix table IV-12--Forest management practices needed on forest land by subbasin, St. Francis River Basin

Subbasins						
Above Wappapello	Below Wappapello	Little River	L'Anguille			
Acres						
361,800	206,800	39,600	87,800			
-	10,900 1/	/ 900 <u>2</u> /	1,400 <u>3</u>			
2,200	1,200	200	-			
23,000	45,900	9,900	-			
12,500	8,900	•				
15,100	9,000	-	•			
-	6,100	•	-			
15,100	9,000	•	-			
18,100	•					
	107,400	18,500	21,500			
81,800	18,300	-	28,100			
	361,800 - 2,200 23,000  12,500 15,100 - 15,100 18,100 55,300	Above Wappapello Below Wappapello Acre 361,800 206,800  - 10,900 1/ 2,200 1,200 23,000 45,900  12,500 8,900 15,100 9,000 - 6,100  15,100 9,000 15,100 9,000 15,100 15,100 9,000 15,100 15,100 16,100	Above Wappapello Below River    Above Wappapello Wappapello River			

<sup>1/</sup> Gullies 3,400 acres; gravel pits 1,500 acres; sheet erosion 6,000 acres.
2/ Gullies 600 acres; gravel pits 300 acres.
3/ Gullies 1,000 acres; gravel pits 400 acres.
4/ Annual figure.

<sup>5/</sup> Commercial forest land less than 10 percent stocked with growing-stock trees.



APPENDIX TABLES - CHAPTER VI

Alternative Plans



Appendix table VI-1--Distribution of wet soils and other benefited flood plain by watershed St. Francis River Basin, Arkansas and Missouri

: Total SCS : benefited : area	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					1,535	62,845	17,157	5,692	6,747	27,855	11,961	17,656	43,258	17,261	53,582	21,500	4,704	14,655	801	78,219	26,886	20,274	11,132
Other SCS benefited flood plain	1 1 1 1 1					1,535	4,073		200	0	0	0	0	4,500	35	0	0	0	0	0	0	0	0	0
of Soils :	1 1 1						58,772	17,157	5,492	6,747	27,855	11,961	17,656	38,758	17,226	53,582	21,500	4,704	14,655	801	78,219	26,886	20,274	11,132
Division of Corps :	1 1 1						37,528	2,643	2,708	7,193	13,241	3,239	17,460	8,307	3,967	123,665	0	40,096	31,853	15,287	108,460	53,684	48,523	685
Wet Soils: Needing: Drainage 1/:	Acres -	0	0	0	0	0	96,300	19,800	8,200	16,940	41,096	15,200	35,116	47,065	21,193	177,247	21,500	44,800	46,508	16,088	186,679	80,570	68,797	11,817
of Watershed : SCS	1 6	100.00	100.00	100.00	100.00	100.00	61.03	86.65	26.99	57.54	67.78	78.69	50.28	82.35	81.28	30.23	100.00	10.50	31.51	4.98	41.90	33,37	29.47	94.20
Percent	1 1	0	0	0	0	0	38.97	13.35	33.03	42.46	32.22	21.31	49.72	17.65	18.72	69.77	0	89.50	68.49	95.02	58.10	66.63	70.53	5.80
Corps 100 yr. flood	1 1	0	0	0	0	0	84,548	7,859	6,554	29,786	22,271	5,728	33,223	24,173	9,347	143,777	0	40,097	40,326	17,757	138,622	53,730	137,547	2,979
Area	1 6	223,360	173,440	126,080	195,840	30,720	216,960	58,880	19,840	70,144	69,120	26,880	918,99	136,960	49,920	206,080	30,720	44,800	58,880	18,688	238,592	80,640	195,008	51,392
CNI Watershed Number		5-1 5-2	5-3	5-4	5-5	5-5a	5-7	5-8 2/	5-9	5-10 2/	5-11	5-11a	5-12	5-13	5-14	5-15	5-15a <u>2</u> /	5-15b	5-16	5-17 2/	5-19	5-20	5-21	$5-22 \ \underline{2}/$

4-33992 5-74

Appendix table VI-1 (cont.)--Distribution of wet soils and other benefited flood plain by watershed St. Francis River Basin, Arkansas and Missouri

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Corps   Corp								• •		••
The contract of the contract			Corps 100 yr.		of Watershed	: Wet Soils : Needing		of	Other SCS benefited	: Total SCS : benefited
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Number	: Area :	flood	Corps	SCS :	: Drainage 1,	corps:	SCS 4/:	flood plain	area
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		1 1 1 1 .	1 1 1		1 1 1 1	Acres	,         	1 1 1		1 1 1 1 1 1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5-23	119,040	49,285	41.40	58.60	39,338	16,286	23,052	0	23,052
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5-24	87,040	77,903	89.50	10.50	64,097	57,367	6,730	0	6,730
$\frac{62,720}{90,880}  81.50  81.65  18.35  48,127  39,296  8,831  0$ $\frac{62,720}{90,880}  81.111  89.25  100.00  41,030  0$ $\frac{61,030}{90,880}  81.111  89.25  10.50  36,518  57,833  6,366  0$ $\frac{66,560}{560}  59,573  89.50  10.50  36,518  37,804  3,834  0$ $\frac{49,280}{49,280}  43,534  88.34  11.66  32,402  28,624  37,736  0$ $\frac{66,176}{66,176}  51,392  77.66  22.34  34,399  26,714  7,685  0$ $\frac{2}{4},080  81,111  40,390  26,714  7,685  0$ $\frac{2}{4},080  81,331  88.89  11.11  42,392  56,714  7,685  0$ $\frac{2}{4},080  1,053  6.58  93.42  5,106  43,546  64,136  2,562  0$ $\frac{2}{4},080  1,053  6.58  93.42  5,106  41,664  64,136  2,562  0$ $\frac{2}{4},080  1,053  6.58  93.42  5,106  41,664  64,136  2,562  0$ $\frac{2}{4},080  1,053  6.58  93.42  5,300  41,64  64,136  2,562  0$ $\frac{2}{4},080  1,053  6.58  93.42  5,300  40,907  9,393  60  0$ $\frac{2}{4},080  1,053  6.58  93.42  47,800  33,828  60,142  0$ $\frac{2}{4},080  1,054  40,105  10.000  33,828  0$ $\frac{2}{4},080  10,409  60.55  39,45  112,340  58,765  53,575  0$ $\frac{2}{130,560}  79,049  60.55  112,340  58,765  53,575  0$ $\frac{2}{130,500}  120,409  52.31  47.69  112,340  58,765  53,575  0$ $\frac{2}{130,500}  124,467  89.50  10.50  53,887  53,599  6,288  0$	5-25	104,320	•	80.28	19.72	979,79	51,898	12,748	0	12,748
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5-26	62,720	•	81.65	18,35	48,127	39,296	8,831	0	8,831
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-27	62,720	0	0	100.00	41,030	0	41,030	0	41,030
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-28	90,880	•	89.25	10.75	59,219	52,853	998,9	0	998,9
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-29	51,840	•	43.09	56.91	12,725	5,483	7,242	0	7,242
$\frac{2}{49,280}  \begin{array}{c} 75,520  56,136  74,33  25.67  50,861  37,805  13,056  0 \\ 49,280  43,534  88.34  11.66  32,402  28,624  3,778  0 \\ 66,176  51,392  77.66  22.34  23,4399  26,714  7,685  0 \\ 36,224  20,821  57.56  42,44  23,379  13,416  9,991  0 \\ 94,080  83,631  88.89  11.11  48,365  42,992  5,373  0 \\ 27,520  13,037  47,37  52.63  9,849  4,665  5,184  0 \\ 150,000  1,053  6.58  93.42  5,106  336  4,770  0 \\ 150,400  59,229  39.38  60.62  105,800  41,664  64,136  2,562 \\ 9,600  343  357  96,43  2,570  9,297  9,393  60 \\ 118,400  0  0  100.00  33,828  6,142 \\ 85,760  72,175  84.16  15.84  59,300  49,907  9,393  60 \\ 195,200  120,864  61.92  38.08  131,300  81,301  49,999  120 \\ 196,880  154,374  82.61  17.39  104,200  86,080  18,120  200 \\ 197,120  103,108  52.31  47.69  112,340  58,765  53,575  0 \\ 197,120  22,340  89.50  10.50  23,599  6,288  0 \\ 83,200  74,467  89.50  10.50  59,887  53,599  6,288  0 \end{array}$	5-30	66,560	•	89.50	10.50	36,518	32,684	3,834	0	3,834
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-31	75,520	•	74.33	25.67	50,861	37,805	13,056	0	13,056
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-32	49,280	•	88.34	11.66	32,402	28,624	3,778	0	3,778
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-33	66,176	•	77.66	22.34	34,399	26,714	7,685	0	7,685
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		36,224	•	57.56	42.44	23,307	13,416	9,891	0	9,891
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-34	94,080		88.89	11.11	48,365	42,992	5,373	0	5,373
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-35	27,520		47.37	52.63	6,849	4,665	5,184	0	5,184
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5-35a	16,000		6.58	93.42	5,106	336	4,770	0	4,770
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-1	150,400		39.38	60.62	105,800	41,664	64,136	2,562	869,698
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$5a-3 \frac{2}{}$	009,6	343	3.57	96.43	2,570	92	2,478	0	2,478
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-5	118,400		0	100.00	33,828	0	33,828	٦,	39,970
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-6	85,760		84.16	15.84	59,300	49,907	9,393	09	9,453
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-7	195,200	120,864	61.92	38.08	131,300	81,301	666,67	120	50,119
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-8	186,880	154,374	82.61	17.39	104,200	86,080	18,120	200	18,320
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5a-9	130,560	79,049	60.55	39.45	47,800	28,943	18,857	0	18,857
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	5a-10	197,120	103,108	52.31	47.69	112,340	58,765	53,575	0	53,575
a $\frac{3}{4}$ 24,960 22,340 89.50 10.50 23,050 20,630 2,420 0 83,200 74,467 89.50 10.50 59,887 53,599 6,288 0	5a-11	131,200		47.64	52.36	117,900	56,168	61,732	0	61,732
83,200 74,467 89.50 10.50 59,887 53,599 6,288 0	ct .	24,960		89.50	10.50	23,050	20,630	2,420	0	2,420
		83,200			10.50	59,887	53,599	6,288	0	6,288

Appendix table VI-1 (cont.)--Distribution of wet soils and other benefited flood plain by watershed St. Francis River Basin, Arkansas and Missouri

4-3399

	: Other SCS : Total SCS : benefited : benefited : flood plain : area :		0 7,280	0 18,236	0 20,830	0 24,752	1,756 31,757	0 38,231	0 44,979	0 22,052	5,240 51,639	0 50,370	0 14,449	1,013 22,971	27,436 1,283,746
	of Soils SCS 4/	1 1	7,280	18,236	20,830	24,752	30,001	38,231	44,979	22,052	46,399	50,370	14,449	21,958	,256,310
	: : Division of Soils /: Corps : SCS 4/	1	9,287	5,355	6,431	2,499	5,503	3,469	1,492	80	8,563	11,320	17,093	5,117	1,482,316 1,256,310
	wet Soils: Needing: Drainage 1/:	Acres	16,567	23,591	27,261	27,251	35,504	41,700	46,471	22,132	54,962	61,690	31,542	27,075	2,738,626
	Percent of Watershed Corps : SCS :	 	43.94	77.30	76.41	90.83	84.50	91.68	96.79	79.66	84.42	81.65	45.81	81.10	
	Percent of Corps	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	56.06	22.70	23.59	9,17	15.50	8.32	3.21	0.36	15.58	18.35	54.19	18.90	
	Corps 100 yr. flood	 				2,876				144			31,214		,359,032
	: : Area	1 1 1	23,680	35,840	44,160	31,360	56,320	42,240	29,960	39,680	73,600	71,680	27,600	67,200	5,402,240 2,359
2	CNI Watershed Number		5b-1	5b-2 2/	5b-3 _	5b-4	5b-5	5b-6	5b-7	$5b-8 \frac{2}{}$	5b-9	5b-10	5b-11	5b-12	Total

Data Source: Hydrologist data. PL-566.

Wildlife. 14/3/2/1

Area above C of E standard project flood.

Appendix table VI-2--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, economic plan, short range (10-15 years)

INO 5-74									
Watershed Number	: Watershed : Area	: Corps of Eng. :100 Yr. flood	Percent	of Watershed SCS	:Wet Soils :Needing :Drainage	1/: : Benefited Wet : Corps :	Wet Soils : SCS	Other SCS: Benefited: flood plain:	: :Total SCS :benefited : area :
			St.	Francis Riv	Acres	appapello	1 1 1		1
5-7	216,960	84,548	38.97	61.03	96,300	37,528	58,772	4,073	62,845
5-8	58,880	7,859	13.35	86.65	19,800	2,643	17,157		17,157
7-11 <i>a</i> 5-13	080,07	2,720	17.65	82 35	7,7,065	9,239	38 758	005 7	11,961
5-14	49,920	9,347	18.72	81.28	21,193	3,967	17,226		
5-19	238,592	138,622	58.10	41.90	186,679	108,460	78,219	1	
5-26	62,720	51,209	81.65	18.35	48,127	39,296	8,831	1	8,831
5-27	62,720	1	1	100.00	41,030	1	41,030	1	
5–33	66,176	51,392	77.66	22.34	34,399	26,714	7,685	ı	
5-33a	36,224	20,851	57.56	42.44	23,307	13,416	9,891	1	
Subtotal	956,032	393,729			533,100	243,570	289,530	8,608	298,138
				Little	Little River System	em			
5a-1	150,400	59,229	39,38	60.62	105,800	41,664	64,136		
5a-5	118,400	ı	1	100.00	33,828	1	33,828	6,1	
5a-6 5a-7	85,120	72,175	84.16	15.84	59,300	49,907	9,393	90	
5a-8	184,960	154,374	82.61	17.39	104.200	86.080	18,120		
5a-9	129,280	79,049	60,55	39,45	47,800	28,943	18,857	1	
5a-10	197,120	103,108	52.31	47.69	112,340	. 58,765	53,575	1	
Subtotal	1,060,480	588,799			594,568	346,660	247,908	9,084	256,992

Appendix table VI-2 (cont.)--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, economic plan, short range (10-15 years)

	••	••							
CNI	••		••	••	:Wet Soils 1/:			Other SCS :Total SCS	:Total SCS
Watershed	: Watershed :(	:Corps of En	g.: Percent	Corps of Eng.: Percent of Watershed: Needing	Needing		Benefited Wet Soils : Benefited : benefited	: Benefited	:benefited
Number	: Area	:100 Yr. flo	od: Corps	100 Yr. flood: Corps : SCS : Drainage		: Corps : SCS	SOS :	:flood plain:	ı: area
	•••			••					- 1
	1 1 1	1 1 1	1 1 1	1 1 1 1	Acres	1 1 1 1	1 1 1 1	1	
				L'Angu	L'Anguille River				
5b-2	35,840	8,137	22.70	77.30	77.30 23,591	5,355	18,236	ı	18,236
Subtotal	35,840	8,137			23,591	5,355	18,236	1	18,236
Tota1	2,052,352	990,665		1	1,151,259	595,585	555,674	17,692	573,366

 $\underline{1}$ / Data Source: Hydrologist data.

Appendix table VI-3--Structure data - multiple purpose channels St. Francis River Basin, economic plan, short range, (10-15 years)

		: :		:	:	:
•		. : Total :	Drainage Area	Grade	: Weirs for	:
Watershed:	Channe1	: Drainage :		: Stabilization		: Channel
	Improvement		By Structures		: Enhancement	: Excavation
:		: :	•	:	•	:
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yds.)
		<u>s</u>	t. Francis Rive	r Below Wappapel	<u>lo</u>	
5-7	58	339.0	12.7	491	4	377,600
5-8	45	92.0	-	243	3	162,500
5-11a	36	42.0	_	292	-	196,100
5-13	51	214.0	28.8	210	1	225,200
5-14	37	78.0	1.7	150	4	220,000
5-19	367	372.8	_	1,473	3	500,000
5-26	89	98.0	-	355	9	536,200
5-27	67	98.0	_	267	2	207,500
5-33	50	103.4	_	200	15	800,000
5-33a	35	56.6	_	152	2	754,600
J-33a		30.0				754,000
Subtotal	835	1,493.8	43.2	3,833	43	3,979,700
			Little	River System		
5a-1	153	235.0	11.1	1,224	11	367,800
5a-5	50	185.0	13.8	422	1	390,800
5a-6	95	133.0	5.2	759	4	330,500
5a-7	188	305.0	1.2	1,504	6	1,482,400
5a-8	229	289.0	3.9	1,835	29	2,197,000
5a-9	105	202.8	_	849	6	226,200
5a-10	256	308.0	_	2,418	12	1,236,400
Subtotal	1,076	1,657.8	35.2	9,011	69	6,231,100
			L'Angu	il <u>l</u> e River		
51 0						
5b-2	48	56.0	_	200	-	938,100
Subtotal	48	56.0	_	200	-	938,100
Total	1,959	3,207.6	78.4	13,044	112	11,148,900

Appendix table VI-4--Summary estimated structure cost distribution St. Francis River Basin, economic plan, short range (10 - 15 years)

Funds Total	Mon-Federal tion Cost			115,600 479,500 688,800 4,758,400		587,800 2,247,200 228,200 782,000		2,941,100 14,678,400		641,100 4,174,100	325,500 1,938,600		314,400 1,276,600 832,000 3,050,000	4,054,10C 21,271,000		248,000 845,100	248,000 845,100	
Cost - Other Funds	Land Ease- ments & R/W		297,500	20,000 576,000	72,000	125,000 62,000	35,000 29,000 143,700	1,397,200		248,000	85,000	29,000 58,500	45,400 208,000	1,075,900		136,500	136,500	
Installation	Project admin.	Reservoir	21,800	3,400	3,900	15,600	2,300 7,300 4,900	96,500		28,300	13,600	20,800	9,400	147,800		2,500	2,500	
	Construc- tion	Dollars 1/ Below Wappapello Reservoir	164,000 114,800	92,200 83,600	68,100	160,300	62,000 150,400 104,800	1,447,400	Little River System	364,800	226,900	515,600	259,600	2,830,400	L'Anguille River	109,000	109,000	
Funds	Total P. L. 566	St. Francis River Be	2,937,800	363,900	500,900	1,659,400	201,400 480,700 544,300	11,737,300	Little	3,533,000	1,613,100	2,304,100	962,200	17,216,900	L'Angu	597,100	597,100	
st - P. L. 566 Funds	Project admin.	St. Fr	459,200 81,600	67,700 611,100	83,500	317,100	41,200 99,000 95,400	1,966,400		580,400	274,500	420,900 603,600	184,400	2,997,100		50,000	50,000	
Installation Co	Engineer- ing	-	215,500	31,400 290,600	39,800	141,900	16,800 40,000 45,000	000*†06		268,900	125,900	192,500	82,300 189,500	1,368,600		100,100	100,100	
a	Construc- tion	1 1 2 1 1 1	2,263,100	264,800 3,167,900	377,600	1,200,400	143,400 341,700 403,900	8,866,900		2,683,700	1,212,700	1,690,700	1,602,400	12,851,200		000,744	447,000	
	Item		5-7	5-11a 5-13	5-14	5-19	5-27 5-33 5-33a	Subtotal		5a-1	5a-6	5 <b>a-</b> 7	5a-9 5a-10	Subtotal		5p-2	Subtotal	

4-33992 5-74

 $\frac{1}{2}$  Price base: 1970

## Appendix table VI-5--Total installation and annual costs St. Francis River Basin, economic plan, short range (10 - 15 years)

	:	:	:	:
	:	: Amortization	: Operation	:
	: Total	: of	: and	:
	: Installation	: Installation	: Maintenance	:
rshed Number	: Cost	: Cost 1/	: Cost 2/	: Total
		dollars -		
	St. Fra	ncis River Below Wappanel	lo Reservoir	•
5-7	3,421,100	235,500	18,800	254,300
5-8	581,500	40,000	13,500	53,500
5-11a	479,500	33,000	10,400	43,400
5-13	4,758,400	32 <b>7,</b> 500	20,000	347,500
5-14	644,900	44,400	11,400	55,800
5-19	2,247,200	154,700	101,800	256,500
5-26	782,000	53,800	23,000	76,800
5-27	300,700	20,700	17,000	37,700
5-33	665,400	45,800	12,400	58,200
5-33a	797,700	54,900	8,700	63,600
Subtotal	14,678,400	1,010,300	237,000	1,247,300
		Little River System	<u>1</u>	
5a-1	4,174,100	287,300	48,000	335,300
5a-5	3,869,000	266,300	20,100	286,400
5a-6	1,938,600	133,400	28,300	161,700
5a-7	2,869,500	197,500	54,200	251,700
5a-8	4,093,200	281,700	64,300	346,000
5a-9	1,276,600	87,900	29,200	117,100
5a-10	3,050,000	209,900	72,000	281,900
Subtotal	21,271,000	1,464,000	316,100	1,780,100
343 50 541	21,212,000	L'Anguille River	510,100	1,100,100
5b-2	845,100	58,200	4,800	63,000
Subtotal	845,100	58,200	4,800	63,000
Grand Total	36,794,500	2,532,500	557,900	3,090,400

Price Base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

 $<sup>\</sup>underline{2}/$  Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-5a--Total installation and annual costs St. Francis River Basin, economic plan, short range (10 - 15 years)

	:	:	:	:
	•	: Amortization	: Operation	:
	: Total	: of	: and	:
	: Installation	: Installation	: Maintenance	:
rshed Number	Cost	: Cost 1/	: Cost 2/	: Total
		dollars		
	St. Fra	ncis River Below Wappapel	lo Reservoir	·
5-7	3,421,100	201,700	18,800	220,500
5-8	5 <b>81,5</b> 00	34,300	13,500	47,800
5-lla	479,500	28,300	10,400	38,700
5-13	4,758,400	280,500	20,000	300,500
5-14	644,900	38,000	11,400	49,400
5-19	2,247,200	132,500	101,800	234,300
5-26	782,000	46,100	23,000	69,100
5-27	300,700	17,700	17,000	34,700
5-33	665,400	39,200	12,400	51,600
5-33a	797,700	47,000	8,700	5 <b>5,7</b> 00
Subtotal	14,678,400	865,300	237,000	1,102,300
		Little River System	1	
5a-1	4,174,100	246,100	48,000	294,100
5 <b>a-5</b>	3,869,000	228,100	20,100	248,200
5 <b>a-</b> 6	1,9 <b>3</b> 8,600	114,300	<b>28,3</b> 00	142,600
5a-7	2,8 <b>69,</b> 500	<b>16</b> 9,200	54,200	223,400
5 <b>a-</b> 8	4,093,200	241,300	64,300	305,600
5 <b>a-</b> 9	1,276,600	<b>75,3</b> 00	29,200	104,500
5 <b>a-1</b> 0	3,050,000	179,800	72,000	251,800
Subtotal	21,271,000	1,254,100	316,100	1,570,200
		L'Anguille River		
5b-2	845,100	49,800	4,800	54,600
Subtotal	845,100	49,800	4,800	54,600
Grand Total	36,794,500	2,169,200	557,900	2,727,100

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-6--Estimated annual damages and benefits  $\frac{1}{2}$  St. Francis River Basin, economic plan, short range (10 - 15 years)

		- duli to ad				- POOL 3	_			
water- shed	Irrigated	Non- Irrigated	Other Agri.	Roads & Bridges	Overbank Deposition	plain	Subtotal	Indirect	Total	Drainage
	1		1	1	Dollars	Lars	1		1 1 1	1
				St. Franci	Francis River below Wappapello Reservoir	w Wappapel	lo Reservoi	ᆌ		
				Estim	Estimated average annual damages	ennual da	mages 2/			
5-7	4,900	815,900	51,400	9,700	004	300	882,600	98,300	970,900	
5-11a	30,000	97,200	8,400	1,600	١,		137,200	13,700	150,900	
5-13 1/1-5	001,74	552,500	33,400	6,200 200,000	000,4	2,100	645,300	4,78 5,78	709,800	
5-19	51,300	1,382,000	75,500	14,000	-	3	1,522,800	152,300	1,675,100	
5-26	34,800		24,200	001,4	1		492,300	49,200	541,500	
5-27	53,700	429,500	25,900	7,900	1	•	514,000	51,400	565,400	
5-33	51,300	210,900	12,800	2,400	1 1		277,400	27,700	305,100	
7-334		637,900	,			•	237,900	23,000	629,500	
Total	406,200	4,330,800	268,200	50,000	4,500	2,500	2,500 5,062,200	506,200	5,568,400	
				Estimated	Estimated average annual benefits	al benefit	s 3/			
2-3	2,700	424,800	37,500	8,400	400	300	474,100	47,400	521,500	286,200
5-8	5,500	56,900	19,500	4,000	•		55,900	5,600	61,500	28,700
5-11a	16,600	50,500	6,700	1,400	•	,	75,200	7,500	82,700	59,900
5-13	26,400	284,800	25,500	5,200	1,900	1,000	344,800	34,400	379,200	229,500
5-14	900,69	500,500	9,600	2,000	100	100	147,300	14,700	162,000	120,000
7-19	20,300	745,800	60,700 0,100	12,500 	•	ı	848,100	84,800	932,900	426,200
5-27	30,000	230,000	20,400	200,4		۱ ۱	285 100	20, 40 20, 40 20, 40	30 <b>T</b> ,000	\$ 66 6
5-33	29,100	113,400	10,400	2,100	•	,	155,000	15,500	170,500	57,000
5-33a		300,300	. 1	<b>.</b> 1	•		119,300	11,900	131,200	83,200
Total	229,100	2,293,000	209,700	43,900	2,400	1,400	1,400 2,779,500	277,700	3,057,200	1,615,500
-										

1/ 1974 current normalized prices 2/ Without additional Federal assistance 3/ With FL-566 assistance

Appendix table VI-6 (cont.)--Estimated annual damages and benefits  $\frac{1}{2}$  St. Francis River Basin, economic plan, short range (10 - 15 years)

Water- shed	Crop and Irrigated	and Pasture Non- d Irrigated	Other Agri.	Roads & Bridges	Subtotal	Indirect	Total	Drainage
				Dollars			1	
			긔	Little River System	ystem			
			Estimated	Estimated average annual damages	al damages 2/			
5a-1 5a-5	133,300	494,900 1,141,800	34,600 46,800	6,400 8,700 1,700	669,200	66,900	736,100	
58-7 58-8	192,700	930,960	59,800 44,900	11,100	1,194,500	119,500	1,314,000	
5a-9 5a-10	73,400	220,500 903,100	18,700 59,500	3,500	316,100	31,600	347,700	
Total	885,300	4,556,400	290,900	53,600	5,786,200	578,600	6,364,800	
			Estimated	average annu	Estimated average annual benefits ${ar 3}/$			
5a-1 5a-5 5a-6	73,200	228,800 360,400 132,600	25,600 19,500 17,900	5,300	332,900 384,800 220,300	33,300 38,500 22,000	366,200 423,300 242,300	226,000 101,500 50,200
5a-7 5a-8 5a-9 5a-10	106,300 136,900 40,300 57,300	422,400 261,200 115,000 483,200	47,800 35,900 14,900 47,600	9,900 3,600 9,900	586,400 441,600 173,400 598,000	58,600 44,200 17,300 59,800	645,000 485,800 190,700 657,800	272,000 113,700 90,100 342,200
Total	1480,800	2,003,600	209,200	43,800	2,737,400	273,700	3,011,100	1,195,700

 $\frac{1}{2}/$  1974 current normalized prices.  $\frac{2}{3}/$  Without additional Federal assistance.  $\frac{3}{3}/$  With PL-566 assistance.

Appendix table VI-6 (cont.)--Estimated annual damages and benefits  $\frac{1}{2}$  St. Francis River Basin, economic plan, short range (10-15 years)

2 5-7		0									
Water- sheds	Trrigated	rrigated : irrigated :	Other agri.	Roads & bridges	Urban	Overbank deposition	: rlood-: : plain : : scour :	Subtota1	Indirect	Total	: : Drainage
	1 1 1 1 1	1 1 1 1 1	1 1 1	1 1 1 1 1 1 1 1		Dollars	rs				1 1 1 1 1 1 1 1 1
						L'Anguille River	River				
					Estimate	Estimated average annual damages $\frac{2}{}$	nual dama	ges $\frac{2}{}$			
5b-2	1	128,500	ı	1	ı	I	1	128,500	12,900	141,400	ı
Subbasin total	n total	128,500	ı	ı	1	ı	1	128,500	12,900	141,400	1
Basin total	1,291,500	9,015,700	559,100	103,600	ı	4,500	2,500	2,500 10,976,900 1,097,700	1,097,700	12,074,600	1
					Estimate	Estimated average annual benefits $\underline{3}/$	nual benei	fits $3/$			
5b-2	1	88,700	1	1	ı	ı	ı	88,700	8,900	97,600	29,000
Subbasin total	n total	88,700	1	1	1	1	1	88,700	8,900	97,600	29,000
Basin total		709,900 4,385,300	418,900	87,700	1	2,400	1,400	1,400 5,605,600	560,300	6,165,900	2,871,100
1/ 197	7/ 01111011	1/ 107/ ourmont normalized aniona									

 $\frac{1}{2}$ / 1974 current normalized prices.  $\frac{2}{3}$ / Without additional federal assistance.  $\frac{3}{3}$ / With PL-566 assistance.

Appendix table VI-7--Comparison of benefits and costs for structural measures St. Francis River Basin, economic plan, short range (10 - 15 years)

	Average	Annual Benefit	s <u>1</u> /		
Watershed	Damage Reduction	Agricultural Water Management	Total	Average Annual Cost 2/	Benefit To Cost Ratio
			Dollars		
		St. Francis Riv	ver Below Wapp	apello Reservoir	
5 <b>-</b> 7	521,500	282,200	803,700	254,300	3.16:1
5 <b>-</b> 8	61,500	28,700	90,200	53,500	1.68:1
5 <b>-11a</b>	82,700	59,900	142,600	43,400	3.28:1
5-13	379,200	229,500	608,700	347,500	1.75:1
5-14	162,000	120,000	282,000	55,800	5.05:1
5-19	932,900	426,200	1,359,100	256,500	5.29:1
5-26	301,800	64,800	366,600	76,800	4.77:1
5-27	313,900	260,000	573,900	37,700	15.22:1
5-33	170,500	57,000	227,500	58,200	3.90:1
5 <b>-33a</b>	131,200	83,200	214,400	63,600	3.37:1
)-33 <b>a</b>	131,200	05,200	214,400		2.21.0-
Subtotal	3,057,200	1,611,500	4,668,700	1,247,300	
		<u>Li</u>	ittle River Sy	stem	
5 <b>a-1</b>	366,200	226,000	592,200	335,300	1.76:1
5a-5	423,300	101,500	524,800	286,400	1.83:1
5a-6	242,300	50,200	292,500	161,700	1.80:1
5a-7	645,000	272,000	917,000	251,700	3.64:1
5 <b>a-</b> 8	485,800	113,700	599,500	346,000	1.73:1
5a-9	190,700	90,100	280,800	117,100	2.39:1
5 <b>a-1</b> 0	657,800	342,200	1,000,000	281,900	3.54:1
Subtotal	3,011,100	1,195,700	4,206,800	1,780,100	
		L	'Anguille Rive	<u>c</u>	
Eh-O	07 600	_		-	2 50.1
5 <b>b-</b> 2	97,600	59,900	157,500	63,000	2.50:1
Subtotal	97,600	59,900	157,500	63,000	
Total	6,165,900	2,867,100	9,033,000	3,090,400	

 $<sup>\</sup>underline{1}/$  1974 current normalized prices.  $\underline{2}/$  Average annual cost amortized over a 100-year period at 6-7/8 percent interest.

Appendix table VI-7a--Comparison of benefits and costs for structural measures St. Francis River Basin, economic plan, short range (10 - 15 years)

	Average	e Annual Benefit			
	Damassa	Agricultural Water		Average Annual	Benefit
Watershed	Damage Reduction	Management	Total	Cost 2/	To Cost Ratio
			Dollars -		
		St. Francis Ri	ver Below Wappa	apello Reservoir	
5 <b>-7</b>	521,500	282,200	803,700	220,500	3.64:1
5 <b>-</b> 8	61,500	28,700	90,200	47,800	1.88:1
5-lla	82,700	59,900	142,600	38,700	3.68:1
5-13	379,200	229,500	608,700	300,500	2.03:1
5-14	162,000	120,000	282,000	49,400	5.71:1
5-19	932,900	426,200	1,359,100	234,300	5.80:1
5-26	301,800	64,800	366,600	69,100	5.30:1
5-27	313,900	260,000	573,900	34,700	16.54:1
5-33	170,500	57,000	227,500	51,600	4.41:1
5-33a	131,200	83,200	214,400	55,700	3.85:1
)-33a			227,400		
Subtotal	3,057,200	1,611,500	4,668,700	1,102,300	
		<u>I</u>	ittle River Sys	stem	
5 <b>a-l</b>	366,200	226,000	592,200	294,100	2.01:1
	423,300	101,500	524,800	248,200	2.11:1
5 <b>a-</b> 5		* *			
5a-6	242,300	50,200	292,500	142,600	2.05:1
5a-7	645,000	272,000	917,000	223,400	4.10:1
5a-8	485,800	113,700	599,500	305,600	1.96:1
5 <b>a-</b> 9	190,700	90,100	280,800	104,500	2.69:1
5a-10	657,800	342,200	1,000,000	251,800	2.97: <b>1</b>
Subtotal	3,011,100	1,195,700	4,206,800	1,570,200	
			! Anguillo Bisson		
		4	'Anguille River	-	
5b <b>-</b> 2	97,600	59,900	157,500	54,600	2.88:1
Subtotal	97,600	59,900	157,500	54,600	
				· · · · · · · · · · · · · · · · · · ·	
Total	6, <b>1</b> 65,900	2,867,100	9,033,000	2,727,100	

<sup>1/ 1974</sup> current normalized prices. 2/ Average annual cost amortized over a 100-year period at 5-7/8 percent interest.

Appendix table VI-8--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, economic plan, long range

			,				20m - 9.		
CNI Wshd. no.	Watershed area	Corps of Eng. 100 yr. flood	Percent o	Percent of watershed Corps SCS	Wet soils 1/ needing drainage	Benefited Corps	wet soils SCS	Other SCS benefited flood plain	Total SCS benefited area
	1 1 1				Acres				
				St. Francis	River Below Wappapello	apello			
5-9	19,840	6,554	33.03	66.97	8,200	2,708	5,492	200	5,695
5-11	021,69	22,271	32.22	67.79	41,096	13,241	27,855	•	27,855
5-12	66,816	33,223	49.72	50.28	35,116	17,460	17,656	•	17,656
7-17 5-158	30,720	111,547	11.60	30.00	21.500	723,007 -	73,707 500,10		53,582
5-15b	008,44	40,097	89.50	10.50	008, 44	960,04	40,4	•	4704
5-16	58,880	40,326	64°89	31.51	46,508	31,853	14,655	•	14,655
)-T.	10,000 900,301	17,757 137 517	35.55 53.55	4 c	16,088	15,287	80T	•	108
5-25	104,320	83,746	80.28	19.72	25.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45	51.898	12,748		10,748
5-29	51,840	22,340	43.09	56.91	12,725	5,483	7,242	•	7,242
5-31	75,520	56,136	74.33	25.67	50,861	37,805	13,056	•	13,056
Subtotal	1,011,776	633,560			604,524	395,212	209,312	500	209,512
				म्य	Little River System				
5a-11 5a-12	126,080 83,200	62,506 74,467	44°64 89°50	52.36 10.50	117,900 59,887	56,168 53,599	61,732 6,288	• •	61,732 6,288
Subtotal	209,280	136,973			177,787	109,767	020,89	•	68,020
Total	1,221,056	770,533			782,311	504,979	277,332	200	277,532

1/ Data source: Hydrologist data

## Appendix table VI-9--Structure data - multiple purpose channels St. Francis River Basin, economic plan, long range

Watershed Number	: : Channel : Improvement	: Total : : Drainage : : Area :	21-11-60 111-04	: Grade Stabilization Structures	: : Weirs for : Habitat : Enhancemen	: : Channel :t: Excavation
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yd.)
		St.	Francis River Be	low Wappapello		
5-9 5-10 5-11 5-12 5-15a 5-15b 5-16 5-17 5-21 5-25 5-29 5-31	17 19 81 50 256 35 72 38 38 225 76 94 128	31.0 109.6 108.0 104.4 322.0 48.0 70.0 92.0 29.2 304.7 163.0 81.0 118.0	- 28.2 - - - - - - - -	95 5 527 203 2,053 280 578 146 140 922 312 378 486	- 2 5 2 4 2 4 - 10 1 2	170,000 355,500 391,400 137,400 500,800 500,000 241,000 90,000 365,500 170,000 490,000 270,600
Subtotal	1,129	1,580.9	28.2	6,125	36	4,345,700
			Little River	System		
5a-11 5a-12	225 46	197.0 130.0	-	1,636 188	3 4	2,265,000 388,900
Subtotal	271	327.0	-	1,824	7	2,653,900
Total	1,400	1,907.9	28.2	7,949	43	6,999,600

Appendix table VI-10--Summary estimated structure cost distribution 1/2 St. Francis River Basin, economic plan, long range

Ins Construction tion 1,698,200 542,900 190,800 1,516,700 1,516,700 1,719,800 887,900 279,800 887,900 279,300 4,116,600 4,75,74,600	Insta Construc- tion tion 14,100 98,200 42,900 90,800 16,700 58,500 79,700 79,300 16,600 27,300	Installation Cost truc- Engineer- on ing 00 13,600 00 280,000 64,200 00 64,200 00 187,300 00 19,500 00 14,500 00 148,500 00 148,500 00 148,500 00 56,800 00 56,800 00 56,800 00 56,800 00 104,300 00 50,400	29,500 157 142,000 2.093 42,000 2.093 2.700 2.20 1.27,000 2.20 1.234 74.700 387,110,900 5.76 117,200 5.94	St.   1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Construct   Project   Construct   Project   Admin.   Installation Construct   Project   Admin.   Installation Construct   Admin.   Installation Construct   Admin.   Installation Construct   Installation Construct   Installation   Installation	Installation Project admin.  ars elow Wappapel 1,400 5,600 19,600 2,500 6,400 1,200 1,200 1,200 1,400 6,000 7,300 6,000 1,700 6,000	2st - Other Land Ease- Lend Ease- 227,600 94,000 95,000 95,000 38,300 110,500 111,100	Funds  Total  Non-Federal  116,000 333,200 334,300 122,900 669,700 269,100 78,100 78,100 255,100 472,700 154,500 228,200 228,200 3,319,600	Total Installa- tion Cost 273,200 2,475,800 1,055,400 388,100 388,100 2,763,500 312,000 932,600 2,81,000 541,500 797,500 623,100
1,781,500 211,300 167,200 19,600	211,3( 19,6(	88	460,400 47,300	2,453,200 234,100	Little River Systems 634,300 22,60 70,200 2,60	Systems 22,600 2,600	137,500	794,400	3,247,600
1,948,700 230,900	230,900		507,700	2,687,300	704,500	25,200	164,500	894,200	3,581,500
9,523,300 1,275,200	1,275,200		2,117,400	12,915,900	2,833,900	104,300	1,275,600	4,213,800	17,129,700
		1							

1/ Price base: 1970

Appendix table VI-ll--Total installation and annual costs St. Francis River Basin, economic plan, long range

	:	:	:	:
	:	: Amortization	: Operation	:
	: Total	: of	: and	:
atershed	: Installation	: Installation	: Maintenance	:
Number	: Cost	: Cost 1/	: Cost 2/	: Total
		dolla	rs	
	St. Francis Riv	ver Below Wappapello 1	Reservoir	
5 <b>-</b> 9	273,200	18,800	2,400	21,200
5-10	2,475,800	170,400	9,900	180,300
5-11	1,055,400	72,600	22,300	94,900
5-12	388,100	26,700	13,500	40,200
5-15	2,763,500	190,200	72,100	262,300
5-15a	315,000	21,700	10,500	32,200
5-15b	932,600	64,200	20,100	84,300
5-16	248,100	17,100	12,700	29,800
5-17	1,226,900	84,400	1 2,600	97,000
5-21	1,707,500	117,500	60,300	177,800
5-25	541,500	37,300	20,800	58,100
5-29	797,500	54,900	25,800	80,700
5-31	823,100	56,700	26,600	83,300
Subtotal	13,548,200	932,500	309,600	1,242,100
	L	ittle River System		
5a-11	3,247,600	223,500	64,000	287,500
5a-12	333,900	23,000	11,600	34,600
Subtotal	3,581,500	246,500	75,600	322,100
Total	17,129,700	1,179,000	385,200	1,564,200

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-lla--Total installation and annual costs St. Francis River Basin, economic plan, long range

17,129,700	1,009,700	385,200	1,394,900
3,581,500	211,100	75,600	286,700
333,900	19,700	11,600	31,300
	• •	•	255,400
_			
Ť	ittle River System		
13,548,200	798,600	<b>3</b> 09 <b>,6</b> 00	1,108,200
823,100	48,500	26,600	75,100
			72,800
	31,900		52,700
	100,700		161,000
1,226,900	72,300	12,600	84,900
248,100	•	12,700	27,300
932,600	55,000	20,100	75,100
315,000	18,600	10,500	29,100
2,763,500	162,900	72,100	235,000
388,100	22,900	13,500	36,400
1,055,400	62,200	22,300	84,500
	145,900	9,900	155,800
273,200	16,100	2,400	18,500
St. Francis Ri	ver Below Wappapello	Reservoir	
	do <u>ll</u>	ars	
: Cost			: Total
			:
	•	•	:
:	: Amortization	: Operation	:
	st. Francis Ri  273,200 2,475,800 1,055,400 388,100 2,763,500 315,000 932,600 248,100 1,226,900 1,707,500 541,500 797,500 823,100  13,548,200  13,548,200  13,548,200  13,548,500	: Total : of : Installation : Installation : Cost : Cost 1/	Total       : Total       : Installation       : Maintenance         : Cost       : Cost       1/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-12--Estimated damages and benefits  $\frac{1}{2}$  St. Francis River Basin, economic plan, long range

									the second second second		
Water- sheds	Crops ar Irrigated	and Pasture Non- d Irrigated	Other Agri.	Roads & Bridges	Urban	Overbank Deposition	Flood- plain Scour	Subtotal	Indirect	Total	Drainage
	1					Dollars	178	1 1			0
				St. F	rencis R	St. Francis River Below Wappapello Reservoir	арраре11	Reservoir			
					Estimat	Estimated average annual damages 2/	unual dan	lages 2/			
5-9		59,800	4,100	009		009	009	65,700	009	72,300	
7.7 1.1 1.1	45,300	323,400 293,200	19,500	1,4 8,5	2,900	37,700	9,800	362,300	36,98	398,300	
라. 라.	17,600		15,600	2,900				291,100	29,100	320,200	
7-15 5-15	27,100		18,700	1, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0				908,100 138,400	13.800	150,000	
5-15b	41,200		12,200	2,400				214,300	27,400	235,700	
5-16	25,100	34,78	23,100	4,300				747,200	700	491,900	
5-21	162,500		25,500	202.4				522,900	52,300	575,200	
5-25	17,400		15,700	2,900				321,000	32,100	353,100	
5-29	18,800		7,400	1,200				150,200	15,000	165,200 343,200	
Total	403,600	3,501,900	223,300	54,300	2,900	32,300	10,400	4,228,700	422,700	4,651,400	
					Estimat	Estimated average annual benefits $\mathfrak{Z}/$	unual ben	efits 3/			
5-9	•	30,300	3,200	009		300	300	34,700	3,500	38,200	56,000
5-10 5-11	6,200	180,100	6,000	3,300 3,500	2,500	20,400	6,700	225,000 198,500	22,500 19,900	247,500	4/ 15,000 142,500
5-12	9,900	135,900	2,600	2,600				161,000	16,100	177,100	102,000
5-15 5-15	15,000	421,700	47,100	6 6 6 6 6				493,600 82,500	49,400 8,200	543,000	22,880 1,13
5-15b	22,600	83,300	9,800	2,000				117,700	1,88 88,1	129,500	21,500
5-16	14,300	211,300	18,500	88°.				247,900	24,800	272,700	88,400
5-21 5-21	91,200		20,400	4,28				291,500	000	320,700	121,400
5-25	6,900		%, य	2,600				179,000	17,900	196,900	58,500
5-29 5-31	21,600		2,100 12,100	2,500				83,900 174,300	8,400 17,400	92,300 191,700	49,600 72,700
Total	210,500	1,919,600	180,800	47,100	2,500	20,700	7,000	2,388,200	239,100	2,627,300	1,029,200 4/15,000
1/ 197	74 current no	1/1974 current normalized prices.		ithout add1	tion Fed	eral assista	nce 3/ Wi	2/ Without addition Federal assistance, 3/ With FL-566 assistance.	sistance, 4/		Incidental recreation.

	: Drainage :		1 1	ı		238,700 32,100	270,800	1,300,000																																
	Total		851,700 196,800	1,048,500	5,699,900	464,600	573,400	3,200,700																																
enefits $\underline{1}/$	Indirect		77,400	95,300	518,000	42,200	52,100	291,200																																
amages and b ng range	Subtotal	es <u>2</u> /	774,300 178,900	953,200	5,181,900	its <u>3</u> / 422,400 98,900	521,300	2,909,500																																
e annual da c plan, lor	Flood-: plain : scour :	lver System annual damages	l f	1	10,400	annual benefits - 4	1	7,000																																
ited averag n, economi	Overbank : 1 deposition : 4 Dollars	Little River average ann	1 1	,	32,300	average an - -	1	20,700																																
Appendix table VI-12 (cont.)Estimated average annual damages and benefits St. Francis River Basin, economic plan, long range	: : : : : : : :	Little Ri Estimated average	1 1	ı	2,900	Estimated - -	I	2,500																																
	Roads & : bridges :		7,600	9,400	63,700	E,800	8,400	55,500																																
ix table VI.	Other : agri. :																																		41,000	50,300	273,600	32,800 7,400	40,200	221,000
Append	pasture : irrigated :		634,500	795,500	4,297,400	335,700 86,100	421,800	2,341,400	1974 current normalized prices. Without additional federal assistance. With PL-566 assistance. Incidental recreation.																															
	Crops and pasture: Non- Irrigated: irriga		91,200	98,000	1 501,600	47,100	50,900	1 261,400	1974 current normalized Without additional fede With PL-566 assistance. Incidental recreation.																															
4-33992	Water-:shed:		5a-11 5a-12	Total	Basin Total 501,600	5a-11 5a-12	Total	Basin Total 261,400	$\frac{1}{2}/\frac{1974}{\text{Withou}}$ $\frac{2}{3}/\frac{\text{Withou}}{4}/\frac{4}{\text{Incide}}$																															

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Appendix table VI-13--Comparison of benefits and costs for structural measures St. Francis River Basin, economic plan, long range

Watershed	Damage Reduction	Agricultural Water Management	Total	Average Annual Cost 1/	Benefit to Cost Ratio
		Do:	llars <u>2</u> /		
	St.	Francis River Bel	ow Wappapello R	eservoir	
5-9 5-10 5-11 5-12 5-15 5-15a 5-15b	38,200 247,500 218,400 177,100 543,000 90,800 129,500	26,000 3/ 15,000 142,500 102,000 211,800 64,400 21,500	64,200 262,500 360,900 279,100 864,800 155,200 151,000	21,200 180,300 94,900 40,200 262,300 32,200 84,300	3.02:1 1.45:1 3.80:1 6.94:1 3.29:1 4.81:1 1.79:1
5-16 5-17 5-21 5-25 5-29 5-31	272,700 108,500 320,700 196,900 92,300 191,700	88,400 70,400 121,400 58,500 49,600 72,700	361,100 178,900 442,100 255,400 141,900 264,400	29,800 97,000 177,800 58,100 80,700 83,300	12.11:1 1.84:1 2.37:1 4.37:1 1.75:1 3.17:1
Subtotal.	2,67,300	1,029,200 <b>3/</b> 15,000	3,766,500 <b>3/</b> 15,000	1,242,100	
		Little Riv	ver System		
5a-11 5a-12	464,600 108,800	238,700 32,100	703,300 140,900	287,500 34,600	2.44:1 4 <b>.07:</b> 1
Salvinota.).	573,400	270,800	844,200	322,100	
Zotal.	3,200,700	1,315,000	4,625,700	1,564,200	

<sup>1/</sup> Average annual cost amortised over a 100-year period at 6-7/8 percent interest. 2/ 1974 current normalized prices. 3/ Incidental recreation.

Appendix table VI-13a--Comparison of benefits and costs for structural measures St. Francis River Basin, economic plan, long range

Watershed	Damage Reduction	Agricultural Water Management	Total	Average Annual Cost <u>1</u> /	Benefit to Cost Ratio
		Dol	llars 2/		
	St. F	Francis River Belo	w Wappapello	Reservoir	
5-9 5-10 5-11 5-12 5-15 5-15a 5-15b 5-16 5-17 5-21 5-25 5-29 5-31	38,200 247,500 218,400 177,100 543,000 90,800 129,500 272,700 108,500 320,700 196,900 92,300 191,700	26,000 3/ 15,000 142,500 102,000 211,800 64,400 21,500 88,400 70,400 121,400 58,500 49,600 72,700	64,200 262,500 360,900 279,100 864,800 155,200 151,000 361,100 178,900 442,100 255,400 141,900 264,400	18,500 155,800 84,500 36,400 235,000 29,100 75,100 27,300 84,900 161,000 52,700 72,800 75,100	3.47:1 1.68:1 4.27:1 7.67:1 3.68:1 5.33:1 2.01:1 13.23:1 2.11:1 2.75:1 4.85:1 3.52:1
Subtotal	2,627,300	1,029,200 <u>3</u> / 15,000	3,766,500 <u>3</u> / 15,000	1,108,200	
		Little Riv	ver System		
5 <b>a-11</b> 5 <b>a-1</b> 2	464,600 108,800	238,700 32,100	703,300 140,900	255,400 <b>31,</b> 300	2.75:1 4.50:1
Subtotal	573,400	270,800	844,200	286,700	
Total	3,200,700	1,315,000	4,625,700	1,394,900	

<sup>1/</sup> Average annual cost amortized over a 100-year period at 5-7/8 percent interest.
2/ 1974 current normalized prices.
3/ Incidental recreation.

Appendix table VI-14--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, economic plan, not feasible for FL-566

Total SCS benefited area	1 1 1	-	'	110000000	0	111	0
Other SCS benefited flood plain		11111	1		ı	1 1 1	•
et soils SCS			1	110000000	0	101	0
Benefited wet soils Corps SCS	<u>ott</u> s		- <u>otts</u>	57,367 52,853 32,684 28,624 42,992 4,665	219,521		85
Wet soils 1/ needing drainage	St. Francis River Above Wappapello	11111	- St. Francis River Below Wappapello	80,570 39,338 64,097 59,219 36,518 32,402 48,365 9,849 5,106	375,464	Little River System 3 2,570 0 23,050	25,620
Percent of watershed Corps SCS	St. Francis Ri	100,00 100,00 100,00 100,00 100,00	St. Francis Ri	33.37 58.60 10.50 10.50 10.50 11.11 52.63 93.42		11ttle 96,43 10,50	
Percent or Corps	1	11111	ı	66.63 41.40 89.50 89.25 89.55 88.34 47.37 6.58		3.57 3.57 89.50	
Corps of Eng. 100 yr. fléod	1		ı	53,730 49,285 77,903 81,111 59,573 43,534 13,631 13,037	462,847	8,960 343 22,340	31,643
Watershed area	 	223,360 88,960 1173,440 126,080 195,840 30,720	838,400	80,640 1119,040 87,040 90,880 66,560 49,280 94,080 27,520 16,000	631,040	8,960 9,600 24,960	43,520
CNI wshd.	1	5 - 1 - 1 - 2 - 1 - 2 - 2 - 2 - 2 - 2 - 2	Subtotal	5-20 5-24 5-24 5-28 5-38 5-32 5-33 5-35 5-35	Subtotal	5a-0 2/ 5a-3 5a-11a 3/	Subtotal

Appendix table VI-14 (cont.)--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, economic plan, not feasible for FL-566

5b-1         23,680         13,275         56.06         43.94         16,567         9,287         0           5b-3         10,418         23,59         76,41         27,251         2,499         0           5b-4         31,360         2,876         90.83         27,251         2,499         0           5b-5         56,960         1,827         90.83         27,251         2,499         0           5b-5         56,960         1,827         15,50         96.79         41,700         3,469         0           5b-7         56,960         1,827         3.21         96.79         46,471         1,492         0           5b-9         73,600         11,466         15.58         84,42         54,962         8,563         0           5b-10         71,680         11,466         15.58         84,42         54,962         11,320         0           5b-11         57,600         12,698         18.39         81.65         17,093         0           5b-12         67,200         12,698         18,90         81.10         27,075         5,117         0           subtotal         524,800         109,171         370,023         70,774	CNI wshd.	Watershed	Corps of Eng. 100 yr. flood	Percent of watershed	watershed SCS	Wet soils 1/ needing drainage	Benefited wet soils Corps SCS	et soils SCS	Other SCS benefited flood plain	Total SCS benefited area
23,680 13,275 56.06 43.94 16,567 9,287 76,41 27,261 2,499 231,360 2,876 9,17 90.83 27,251 2,499 56,320 8,732 15,50 84,50 41,700 3,469 56,360 11,827 3.21 96.79 46,471 1,492 73,600 11,466 13,151 18,35 81,65 61,690 11,320 57,600 31,214 54,19 44,281 31,542 17,093 11,320 57,600 12,698 18,90 81,10 27,075 5,117 320 31,214 54,19 44,281 31,542 17,093 11,320 57,600 31,214 54,19 45,81 31,542 17,093 11,320 31,542 18,90 81,10 27,075 5,117 370,023 70,774			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							,
23,680 13,275 56.06 43.94 16,567 9,287 44.1 160 10,418 22.59 76.41 27,261 6,431 31,360 2,876 9,17 90.83 27,251 2,499 56,320 8,732 15,50 84,50 35,504 3,514 8,32 91.68 41,700 3,469 56,960 11,827 3,514 8,32 94.68 41,700 11,492 11,466 115,58 84,42 54,962 11,320 11,320 57,600 31,214 54,19 45,81 31,542 17,093 17,093 67,200 12,698 18,35 81.65 61,690 11,320 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093 17,093					L'Ang	uille River				
31,360 2,876 9,17 90,83 27,251 2,499 56,320 8,732 15,50 84,50 35,504 5,503 42,240 3,514 8,32 91,68 4,1,700 3,469 56,960 11,827 15,58 84,42 54,962 11,492 71,680 11,466 118,35 81,65 61,690 11,320 57,600 31,214 54,19 45,81 31,542 17,093 67,200 12,698 18,90 81,10 27,075 5,117  a1 2,037,760 603,671 771,107 290,387	5b-1 5b-3	23,680	13,275	56.06	43.94	16,567 27,261	9,287	00		00
56,320 8,732 1,5,50 84,50 35,504 5,503 4,69 4,1700 3,469 6,471 1,492 56,960 1,827 3,21 96,471 1,492 1,492 73,600 11,466 15,58 84,42 54,962 11,320 57,600 31,214 54,19 45,81 31,542 17,093 67,200 12,698 18,90 81,10 27,075 5,117 170,1170 1,492 17,093 1,214 54,19 45,81 31,542 17,093 1,714 1,093 1,714 1,003 1,714 1,003 1,003 1,714 1,003 1,714 1,003 1,714 1,003 1,714 1,003 1,714 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,003 1,0	5p-4	31,360	2,876	9.17	90.83	27,251	2,499	0	1 (	0
56,960 1,827 3.21 96.79 46,471 1,492 73,600 11,466 15,58 84,42 54,962 81,563 11,320 11,320 57,600 31,214 54,19 45,81 31,542 17,093 67,200 12,698 109,171 370,023 70,774	58-5	56,320 12,240	8,732 3,514	1. 2. 3. 3.	\$ 6 5.	35,504	5,503 1,603	00	<b>0</b> 1	0 0
73,600 11,466 15,56 84,42 54,962 8,563 11,320 71,680 13,151 18,35 81,65 61,690 11,320 11,320 67,200 12,698 18,90 81,10 27,075 5,117	5p-7	56,960	1,827	3.21	96.79	46,471	1,192	0	•	00
tal 2,037,760 603,671	5p-9	73,600	11, <sup>14</sup> 66	15.58	24.48	74,962	8,563	0 (	0	0 (
67,200         12,698         18,90         81.10         27,075         5,117           tal         524,800         109,171         370,023         70,774           al         2,037,760         603,671         290,387	56-10 56-11	71,600	31,21	10•35 54•19	01.05 45.81	31,542	17,093	o o.		0 0
2,037,760 603,671 370,023 70,774 771,107 290,387	5p-12	67,200	12,698	18.90	81.10	27,075	5,117	0	0	0
2,037,760 603,671 290,387	Subtotal	524,800	171,601			370,023	477,07	0	0	0
	Total	2,037,760	603,671			771,107	290,387	0	0	0

Data source: Hydroligist data Floodway Wildlife नोळाल

Watershed: number:		: drainage :	Drainage area: controlled: by structures:	stabilization:	Weirs for : habitat : enhancement:	Channel excavation			
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yd.)			
		St. Fra	ncis River Above	Wappapello					
5 <b>-1</b>	_	349.0	-	-	_	_			
5 <b>-2</b>	-	139.0	-	-	-	_			
5-3	_	271.0	-	-	-	-			
5-4	-	197.0	-	-	-	-			
5 <b>-5</b>	-	306.0	-	-	-	-			
5 <b>-5a</b>	-	48.0	•	-	-	-			
Subtotal	-	1,310.0	-	-	-	-			
		St. Fra	ncis River Below	Wappapello					
5 <b>-2</b> 0	-	126.0	-	-	-	-			
5-23	-	186.0	-	•	-	-			
5-24	-	136.0	-	-	-	-			
5 <b>-28</b>	-	142.0	-	-	-	-			
5-30	-	104.0	-	-	-	-			
5 <b>-32</b>	-	77.0	-	-	-	-			
5-34	-	147.0	-	-	-	-			
5 <b>-35</b>	-	43.0	-	-	-	-			
5 <b>-3</b> 5 <b>a</b>		25.0			-				
Subtotal	-	986.0	-	-	-	-			
Little River System									
5a-0	-	14.0		-	0_	-			
5a-3	_	15.0		-	-	-			
5a-lla		39.0	•	-	-	-			
Subtotal	•	68.0	-	-	-	-			
			L'Anguille Rive	<b>.</b> ~					
			D Millertre Have						
5 <b>b-1</b>	-	37.0	-	-	-	-			
5 <b>b-3</b>	-	69.0	-	•	-	-			
5b-4	-	49.0	-	•	-	-			
5 <b>b-</b> 5	-	88.0	•	-	-	-			
5 <b>b-6</b>	-	66.0	-	-	-	-			
5b-7	-	89.0	-	-	-	-			
5 <b>b-</b> 9	-	115.0	-	-	•	-			
5 <b>b-1</b> 0	-	112.0	•	-	-	-			
5 <b>b-11</b>	-	90.0	•	•	-	-			
5 <b>b-12</b>		105.0		-	-	-			
Subtotal	-	820.0	-	-	-	-			
Total		<b>3,184.</b> 0							

Appendix table VI-16--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, no Federal plan, not feasible for FL-566

Total benefited area	1 1	000000	0	00000000	0	101	0
Other SCS benefited area	! ! !	00000	0	000000000	0	101	0
Wet soils 1/ needing drainage		000000	0	80,570 39,538 64,937 59,219 36,518 32,402 48,365 9,849 5,106	375,464	2,750 23,050	25,620
water shed SCS	AcresFrancis River Above Wappapello	100.00 100.00 100.00 100.00 100.00	0 0 Francis River Below Wannanello	33.37 10.55 10.55 11.66 93.42	3 Little River System	0 96.43 10.50	
Percent of watershed Corps SCS	st. Francis	000000	O St. Francis		Litt	3.57 3.57 89.50	
Corps of Eng. 100 yr. flood	-	00000	0	53,730 49,285 77,903 81,111 59,573 43,534 13,037 1,053	462,857	8,960 343 22,340	31,643
Watershed area	1 1 1	223,360 88,960 173,440 126,080 195,840 30,720	838,400	80,640 119,040 87,040 90,880 66,560 66,560 94,080 16,000	631,040	8,960 9,600 24,960	43,520
CNI wshd. no.		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Subtotal	20 20 20 20 20 20 20 20 20 20 20 20 20 2	Subtotal	5a-0 2/ 5a-3 5a-11a 3/	Subtotal

Appendix table VI-16 (cont.)--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, no Federal plan, not feasible for RL-566

Total benefited area	1	000000000000	0
Other SCS benefited area	1 1 1 1 1	00000000000000	0
Wet soils 1/ needing drainage	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16,567 27,261 27,261 35,504 41,700 46,471 54,962 61,690 31,542 27,075	771,107
watershed	Acres L'Anguille River	43.94 76.43 90.83 96.79 81.65 1.10	
Percent of watershed	<u>L'An</u>	56.06 23.59 93.59 15.50 15.58 18.35 18.35 18.39	
Corps of Eng. 100 yr. flood		13,275 10,418 2,876 8,732 3,514 11,466 13,151 31,214 12,698	603,671
Watershed area		23,680 44,160 31,360 56,320 42,240 56,960 73,600 67,200 524,800	2,037,760
CNI wshd. no.		5b-1 5b-4 5b-4 5b-5 5b-7 5b-9 5b-11 5b-12	Total

1/ Data source: Hydrologist data
2/ Floodway
3/ Wildlife

Watershed number	:	drainage:	Drainage area controlled by structures	:stabilization	: Weirs for : habitat : enhancement:	Channel excavation		
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yd.)		
		St. Fra	ncis River Abov	re Wappapello				
5-1	_	349.0	_	-	-	-		
5-2	-	139.0	-	-	-	-		
5-3	-	271.0	-	-	-	-		
5-4	-	197.0	•	-	· -	-		
5-5	-	306.0	-	-	-	-		
5-5a	-	48.0	-	-				
Subtotal	-	1,310.0	-	-	-	-		
		St. Fra	ncis River Belo	ow Wappapello				
5-20	-	126.0	-	-	-	-		
5-23	-	186.0	-	•	-			
5-24	-	136.0	-	-	-	-		
5-28	-	142.0	-	-	-	-		
5-30	-	104.0	-	-	-	-		
5-32	-	77.0	-	-	٦	-		
5-34	-	147.0	-	-	-	-		
5-35	-	43.0	-	-	-	-		
5-35a	<del></del>	25.0		-	<u> </u>			
Subtotal	-	986.0	-	•	-	-		
Little River System								
5 <b>a-</b> 0	_	14.0	-	-	-	-		
5a-3	-	15.0	-	-	-	-		
5a-lla		39.0	-	•	-	-		
Subtotal	-	68.0	=	-	-	-		
			L'Anguille Ri	ver				
5b-1	_	37.0	-		-			
5b-3	-	69.0	-	•	-	-		
5b-4	-	49.0	_	-	-	-		
5b-5	-	88.0	-	-	-	-		
5b-6	-	66.0	-	-	-	-		
5b-7	-	89.0	-	-	-	- '		
5b-9	-	115.0	-	-	-	-		
5b-10	-	112.0	-	-	-	-		
5b-11	-	90.0	-	-	-	-		
5b-12		105.0			-			
Subtotal	-	820.0	-	-	-	-		
Total	-	3,184.0		•	-	-		

Appendix table VI-18--Total installation and annual cost of structural measures St. Francis River Basin, environmental plan

	:	:	:	:
	•	: Amortization	: Operatio	n :
	: Total	: of	: and	:
Watershed	: Installatio	n : Installation	: Maintenan	ce :
Number	: Cost	: Cost 1/	: Cost 2/	: Total
		dollar	'S	
	<i>a.</i> = . =			
	St. Francis R	iver Above Wappapell	lo Reservoir	
5-1	1,000,000	68,800	1,500	70,300
5-2	600,000	41,300	1,000	42,300
5-3	600,000	41,300	1,500	42,800
5-4	600,000	41,300	1,500	42,800
	,	,	_,	_
-	_	-		
5-5	- -	-	_	-
-		<u>-</u>		-

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-18a--Total installation and annual cost of structural measures St. Francis River Basin, environmental plan

	:	•	•	:
	:	: Amortization	: Operation	:
	: Total	: of	: and	:
Watershed	: Installation	: Installation	: Maintenance	:
Number	: Cost	: Cost 1/	: Cost 2/	: Total
		dollar	rs	
	St. Francis Riv	er Above Wappapell	lo Reservoir	
5-1	1,000,000	58,900	1,500	60,400
5-2	600,000	35,400	1,000	36,400
5 <del>-</del> 3	600,000	35,400	1,500	36,900
5-4	600,000	35,400	1,500	36,900
5-5	<u>-</u>	=	-	-
5-5a	-	-	-	-
				<del></del>
Total	2,800,000	165,100	5 <b>,5</b> 00	170,600
TOTAL	2,000,000	107,100	,,,oo	170,00

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-19--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, environmental plan, short range (10 - 15 years)

CNI wshd. no.	Watershed area	Corps of Eng. 100 yr. flood	Percent of Corps	of watershed	Wet soils 1/ needing drainage	Benefited wet	ret soils SCS	Other SCS benefited flood plain	Total SCS benefited area
			1		Acres				1 1 1
				St. Francis	St. Francis River Below Wappapello	apello			
5-7	2 <b>16,96</b> 0	84,548	38.97	61.03 86.65	96,300	37,528	58,772	4,073	62,845
5-11 <b>a</b>	26,880	5,728	21.31	6.6 6.6 6.6	15,200	3,239	14. 18.		196,11
5-13 5-14	136,960	24,173	17.65	81.28	47,065 21,193	% % % % % %	38,758	4,500	43,258
5-19	238,592	138,622	58.10	41.90	186,679	108,460	78,219		78,219
5-26	62,720	51,209	8 <b>1.6</b> 5 -	18.35	48,127 41,030	39,296	8,831 41.030		8,831 41,030
5-33 5-338	66,176 36,224	51,392 20,851	77.66	₹ <b>3</b>	34,399 23,307	26,714 13,416	7,685 9,891		7,685 9,891
Subtotal	956,032	393,729			533,100	243,570	289,530	8,608	298,138
				Litt	Little River System				
5a-1	150,400	59,229	39.38	60.62	105,800	47,664	64,136	2,562	869,698
5a-6	85,120	72,175	84.16	15,84	59,300	106,64	9,393	9,175	9,453
5 <b>a-7</b> 5 <b>a-</b> 8	195,200	120,864	61.98 61.98	38.08 17.30	131,300	81 <b>,301</b>	18,999	120	50,119
5a-9 5a-10	129,280	79,049 103,108	60.55 52.31	39.45	112,340	28,943 58,765	18,857 53,575	} , ,	18,857
Subtotal	1,060,480	588,799			594,568	346,660	247,908	9,084	256,992
				L'An	L'Anguille River				
5 <b>b-2</b>	35,840	8,137	22,70	77.30	23,591	5,355	18,236	r	18,236
Subtotal	35,840	8,137			23,591	5,355	18,236		18,236
Total	2,052,352	990,665			1,151,259	595,585	555,674	17,692	573,366
1/ Data	1/ Data source: Hyd	Hydrologist data							

Watershed number	Channel improvement	Total drainage area	Drainage area controlled by structures	Grade stabilization structures	Weirs for habitat enhancement	Channel excavation		
	Miles	Sq.mi.	Sq.mi.	Number	Number	Cu.yd.		
		St. Fr	ancis River Below	Wappapello				
5-7 5-8 5-11a 5-13 5-14 5-19 5-26 5-27 5-33 5-33a	58 45 36 51 37 367 89 67 50	339.0 92.0 42.0 214.0 78.0 372.8 98.0 98.0 98.0	20.0 - - 28.8 1.7 - - -	491 243 292 210 150 1,473 355 267 200 152	4 3 - 1 4 3 9 2 15 2	377,600 162,500 196,100 225,200 220,000 500,000 536,200 207,500 800,000 754,600		
Subtotal	835	1,493.8	50•5	3,833	43	3,979,700		
Little River System								
5a-1 5a-5 5a-6 5a-7 5a-8 5a-9 5a-10	153 50 95 188 229 105 256	235.0 185.0 133.0 305.0 289.0 202.0 308.0	11.1 13.8 5.2 1.2 3.9	1,224 422 759 1,504 1,835 849 2,418	11 1 4 6 29 6 12	367,800 390,800 330,500 1,482,400 2,197,000 226,200 1,236,400		
Subtotal	1,076	1,657.0	35•2	9,011	69	6,231,100		
			L'Anguille Riv	rer				
5b <b>-</b> 2	48	56.0	-	200	-	938,100		
Subtotal	48	56.0	-	200	-	938,100		
Total	1,959	3,206.8	85•7	13,044	112	11,148,900		

Appendix table VI-21--Summary estimated structure cost distribution  $\frac{1}{2}$  St. Francis River Basin, environmental plan, short range (10 - 15 years)

	Inst	Installation Cost	t - P.L. 566 Funds	5 Funds	ī	Installation	Cost - Other	Funds	Total
Item	Construc- tion	Engineer- ing	Project admin.	Total P.L. 566	Construc- tion	Project admin.	Land Ease- ments & R/W	Total Non-Federal	Installa- tion Cost
	  -  -  -  -	1	1		Dollars - ·	1	1 1		1
				Below I	Below Wappapello Reservoir	ervoir			
5-7 5-8 5-11a	2,862,500 467,200 276,400	276,600 56,400 32,900	558,200 101,600 69,200	3,697,300 625,200 378,500	164,000 114,800 92,200	25,200 4,200 3,400	339,000 37,000 20,000	528,200 156,000 115,600	4,225,500 781,200 494,100
5-13 5-14	3,384,200	317,700	638,200 87,500	4,340,100	83,600 68,100	29,200	576,000 72,000		5,028,900
5-19 5-26	1,455,100	173,700	348,900 126,200	1,977,700	447,200 160,300	15,600	125,000	587,800 228,200	2,565,500
5-27	345,800	42,100	66,500	454,400	62,000	2,300	35,000		553,700
5-33a	431,500	48,500	98,900	578,900	104,800	4,900	143,700	253,400	832,300
Subtotal	10,824,300	1,135,100	2,235,400	14,194,800	1,447,400	006,666	1,438,700	2,986,000 17,180,800	17,180,800
				Lit	Little River System	em			
5a-1 5a-5	3,067,900	316,900	628,400	4,013,200	364,800	28,300	248,000	641,100	4,654,300
58-6	1,444,000	154,800	303,400	1,902,200	226,900	13,600	85,000	325,500	2,227,700
- 8 - 8 - 8 - 6 - 6 - 6 - 6 - 6 - 6 - 6	2,816,900	319,600	653,400	3,789,900	712,300	30,100	58,500		4,590,800
5a-10	1,807,800	215,200	451,800	2,474,800	602,600	21,400	208,000		3,306,800
Subtotal	15,010,500	1,638,500	3,267,000	19,916,000	2,830,400	147,800	1,075,900	4,054,100 23,970,100	23,970,100
5p-2	527,000	110,100	000,09	697,100	L'Anguille River 0 109,000	2,500	136,500	248,000	945,100
Subtotal	527,000	110,100	000,09	697,100	109,000	2,500	136,500	248,000	945,100
Total	26,361,800	2,883,700	5,562,400	34,807,900	4,386,800	250,200	2,651,100	7,288,100 42,096,000	42,096,000

1/ Price base: 1970

Appendix table VI-22--Total installation and annual cost of structural measures St. Francis River Basin, environmental plan, short range (10 - 15 years)

atershed number	Total installation cost	Amortization of installation cost 1/	Operation and maintenance cost <u>2</u> /	Total
		Dollars -		
	St. F	rancis River Below Wapp	papello Reservoir	
5 <b>-</b> 7	4,225,500	290,800	23,200	314,000
5 <b>-</b> 8	781,200	53,800	15,500	69,300
5~lla	494,100	34,000	10,700	44,700
5-13	5,028,900	346,100	21,100	367,200
5-14	684,900	47,100	12,100	59,200
5-19	2,565,500	176,600	116,200	292,800
5-26	937,500	64,500	27,600	92,100
5-27	553,700	38,100	31,300	69,400
5-33	1,077,200	74,100	20,000	94,100
5-33a	832,300	57,300	9,000	66,300
7 33-	-32,311			
Subtotal	17,180,800	1,182,400	286,700	1,469,100
		Little River Sy	rstem	
5a-1	4,654,300	320,400	53,500	373,900
5 <b>a-</b> 5	4,606,400	317,100	24,000	341,100
5a-6	2,227,700	153,300	32,500	185,800
5a-7	3,104,200	213,700	58,700	272,400
5a-8	4,590,800	316,000	72,100	388,100
5a-9	1,479,900	101,900	33,900	135,800
5a-10	3,306,800	227,600	78,300	305,900
Subtotal	23,970,100	1,650,000	353,000	2,003,000
		L'Anguille Rive	er	
Cb 0	01:5 100	45 100	- hoc	70.500
5b <b>-</b> 2	945,100	65,100	5,400	70,500
Subtotal	945,100	65,100	5,400	70,500
Total	42,096,000	2,897,500	645,100	3,542,600

 $<sup>\</sup>underline{1}/$  Price base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Watershed number	Total installation cost	Amortization of installation cost 1/	Operation and maintenance cost 2/	Total
		Dollars		
	St.	Francis River Below War	ppapello Reservoir	
5-7 5-8 5-11a 5-13 5-14 5-19 5-26 5-27 5-33	4,225,500 781,200 494,100 5,028,900 684,900 2,565,500 937,500 553,700 1,077,200	249,100 46,100 29,100 296,500 40,400 151,200 55,300 32,600 63,500	23,200 15,500 10,700 21,100 12,100 116,200 27,600 31,300 20,000	272,300 61,600 39,800 317,600 52,500 267,400 82,900 63,900 83,500
5-33a	832,300	49,100	9,000	58,100
Subtotal	17,180,800	1,012,900	286,700	1,299,600
		Little River S	ystem	
5a-1 5a-5 5a-6 5a-7 5a-8 5a-9 5a-10	4,654,300 4,606,400 2,227,700 3,104,200 4,590,800 1,479,900 3,306,800	274,400 271,500 131,300 183,000 270,600 87,200 194,900	53,500 24,000 32,500 58,700 72,100 33,900 78,300	327,900 295,500 163,800 241,700 342,700 121,100 273,200
Subtotal	23,970,100	1,412,900	353,000	1,765,900
		L'Anguille Riv	<u>er</u>	
5 <b>b-</b> 2	945,100	55,700	5,400	61,100
Subtotal	945,100	55,700	5,400	61,100
Total	42,096,000	2,481,500	645,100	3,126,600

<sup>1/</sup> Price base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

 $<sup>\</sup>frac{2}{2}$  Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VI-23--Estimated annual damages and benefits St. Francis River Basin, environmental plan, short range (10-15 years )

5										
-74 -74	Crops and	Pasture Non-	Other :Ro	: Roads &: (	: :Roads &: Overbank : :Bridges:Denosition:	Flood-: plain :	Subtotal	 במתיומת במתיומת	To+91	 Drainage
Maretalled		1111691111		Tages: N	Dollars	l S	.11		10tar	· Diamage
			St.	Francis	River Bel	ow Wappar	Francis River Below Wappapello Reservoir	voir		
				Estimated	Average	Annual Damages	mages 2/			
5-7	4,900	815,900		9,700	400	300	882,600	88,300	970,900	
5-8 5-11a	30,100	51,900 97,200		4,500 1,600	i, I	1 1	90,900 137,200	9,100 13,700	150,000	
5-13	47,100	552,500	33,400	6,200	4,000	2,100	645,300	64,500	709,800	
5-19	51 300	1 382,000		14,000	P T	1	522,800	152,300	1.675.100	
5-26	34,800	428,900		4,400			492,300	49,200	541,500	
5-27	53,700	429,500		4,900			514,000	51,400	565,400	
5-33 5-33a	51,300	210,900 235,900		2,400			277,400 235,900	27,700	305,100 259,500	
Total	406,200	4,330,800	268,200 50	50,000	4,500	2,500	5,062,200	506,200	5,568,400	
				Estimated	Average	Annual Benefits	nefits 3/			
5-7	2,700	427,800		8,400	400	200	477,000	47,700	524,700	286,200
5–8	5,500	26,900	19,500	4,000	ı	,	55,900	5,600	61,500	28,700
5-11a 5-13	16,600	50,500		1,400	1.900	1,000	308.800	30,900	339,700	59,900
5-14	000,69	66,500		2,000	100	. 100	147,300	14,700	162,000	120,000
5-19	29,300	745,800		12,500	í	ı	848,100	84,800	932,900	426,200
5-26	20,000	231,000	19,400	4,000	ı	ı	274,400	27,400	301,800	64,800
5-2/	29,100	113 400		7,100		l i	155,000	15,500	170,500	57,000
5-33a		119,300	ł	2016-			119,300	11,900	131,200	83,200
Total	229,100	2,260,000 209,700 43,900	209,700 4	3,900	2,400	1,300	2,746,400	274.500	3.020.900	1,615,500

Without additional federal assistance. With PL-566 assistance. 1974 current normalized prices. 13|5|1

Appendix table VI-23 (cont.)--Estimated annual damages and benefits St. Francis River Basin, environmental plan, short range (10 - 15 years)

	: Crops and	and Pasture						
Watershed	: Irrigated:	: Non-	Other Agri.	:Roads &: :Bridges: S	Subtotal :	Indirect	: Total	: Drainage
			IJ	ittle Ri	Little River System			
		я́	stimated	Average	Estimated Average Annual Damages $\underline{2}/$	.8es <u>2/</u>		
5a-1	133,300	494,900	34,600	6,400	669,200	006,990	736,100	
5a-5 5a-6	120,400	1,111,000	48,800 26,600	8,700 4,700	1,169,900 508,100		1,286,900 558,900	
5a-7	192,700		59,800	11,100	1,169,400		1,286,300	
5a-9	73,400		18,700	3,500	310,200			
5a-10	102,800	903,100	59,500	11,000	1,076,400	107,600	1,184,000	
Total	872,700	4,471,200	292,900	53,600	5,690,400	568,900	6,259,300	
		Ä	stimated	Average	Estimated Average Annual Benefits $\frac{3}{2}$	fits $\frac{3}{}$		
5a-1	73,200	228,800	25,600	5,300	332,900	33,300	366,200	226,000
5a-5	700	360,400	19,500	4,200	384,800	38,500	423,300	101,500
5a-6	66,100	132,600	17,900	3,700	220,300	22,000	242,300	50,200
5a-7	106,300	422,400	47,800	006,6	586,400	58,600	645,000	272,000
5a-8	136,900	261,200	35,900	7,600	441,600	44,200	485,800	113,700
5a-9 5a-10	40,300	115,000 483,200	14,900 47,600	3,200 9,900	173,400 598,000	17,300	190,700 657,800	90,100 343,200
	008 087	2 003 600	008 500 700 63 800	73 800	2 737 400	273, 700	3.011.100	1.196.700

1/ 17/4 current normalized prices.

2/ Without additional federal assistance.

3 With PL-566 assistance.

Appendix table VI-23 (cont.)--Estimated average annual damages and benefits 1/St. Francis River Basin, environmental plan, short range (10-15 years)

Total : Drainage		141,400	141,400 -	11,969,100		97,600 59,900	97,600 59,900	6,129,600 2,872,100
Indirect		12,900	12,900			8,900	8,900	557,100
Flood-: : : : : : : : : : : : : : : : : : :	$\frac{\text{er}}{1 \text{ damages } \frac{2}{2}}$	- 128,500	- 128,500	2,500 10,881,100 1,088,000	I benefits $3/$	- 88,700	- 88,700	1,300 5,572,500
Overbank : deposition : : : : : : : : : : : : : : : : : : :	$\frac{\text{L'Anguille River}}{\text{Estimated average annual damages } \frac{2}{}$	ı	1	4,500	Estimated average annual benefits $\overline{3}/$	ı	I	2,400
Roads & : bridges : Urban	Estíma	1	l I	103,600 -	Estima	1	1	87,700 -
Other agri.		1	ı	561,100		ı	ı	418,900
Crops and pasture: Non- Irrigated: irrigated:		128,500	128,500	8,930,500		88,700	88,700	4,352,300
Crops and Irrigated		-	-	sin total 1,278,900		ı	1	709,900
Water-		5b-2	Total	Basin total		5b-2	Total	Basin total

 $\underline{1}/$  Current normalized prices.  $\underline{2}/$  Without additional federal assistance.  $\overline{3}/$  With PL-566 assistance.

Appendix table VI-24--Comparison of benefits and costs for structural measures St. Francis River Basin, environmental plan, short range (10 - 15 years)

	: Avera	ge Annual Ben	efits $\frac{1}{}$	:	
	•	: Agricultura	1 :	: Average :	Benefit
	: Damage	: Water	•		To Cost
Watershed	: Reduction		: Total	: Cost 2/:	Ratio
			Dollars		
	2.	n , n,	D 1 17	11 D	
	St.	rrancis kiver	Below Wappap	ello keservo	<u>1r</u>
5-7	524,700	286,200	810,900	314,000	2.58:1
5-8	61,500	28,700	90,200	69,300	1.30:1
5-11a	82,700	59,900	142,600	44,700	3.19:1
5-13	339,700	229,500	569,200	367,200	1.55:1
5-14	162,000	120,000	282,000	59,200	4.76:1
5-19	932,900	426,200	1,359,100	292,800	4.67:1
5-26	301,800	64,800	366,600	92,100	3.98:1
5-27	313,900	260,000	573,900	69,400	8.26:1
5-33	170,500	57,000	227,500	94,100	2.41:1
5-33a	131,200	83,200	214,400	66,300	3.23:1
Subtotal	3,020,900	1,615,500	4,636,400	1,469,100	
		Litt	le River Syst	em	
5a-1	366,200	226,000	592,200	373,900	1.41:1
5a-5	423,300	101,500	524,800	341,100	1.53:1
5a-6	242,300	50,200	292,500	185,800	1.57:1
5a-7	645,000	272,000	917,000	272,400	3.36:1
5a-8	485,800	113,700	599,500	388,100	1.54:1
5a-9	190,700	90,100	280,800	135,800	2.06:1
5a-10	657,800	343,200	1,001,000	305,900	3.27:1
Subtotal	3,011,100	1,196,700	4,207,800	2,003,000	
		L'An	guille River		
5b-2	97,600	59,900	157,500	70,500	2.23:1
Subtotal	97,600	59,900	157,500	70,500	
Total	6,129,600	2,872,100	9,001,700	3,542,600	

 $<sup>\</sup>frac{1}{2}$  Current normalized prices. Average annual cost amortized over a 100-year period at 6-7/8 percent interest.

Appendix table VI-24a--Comparison of benefits and costs for structural measures St. Francis River Basin, environmental plan, short range (10 - 15 years)

	: Avera	ge Annual Bene			
	•	: Agricultural	:	Average:	Benefit
	: Damage	: Water	•	: Annual :	To Cost
<i>l</i> atershed	: Reduction			: Cost <u>2</u> /:	Ratio
		<u>-</u>	ollars		
	St.	Francis River	Below Wappape	ello Reservo	ir
5-7	524,700	286,200	810,900	272,300	2.98:1
5-8	61,500	28,700	90,200	61,600	1.46:1
5-11a	82,700	59,900	142,600	39,800	3.58:1
5-13	339,700	229,500	569,200	317,600	1.79:1
5-14	162,000	120,000	282,000	52,500	5.37:1
5-19	932,900	426,200	1,359,100	267,400	5.08:1
5-26	301,800	64,800	366,600	82,900	4.42:1
5-27	313,900	260,000	573,900	63,900	8.98:1
5-33	170,500	57,000	227,500	83,500	2.72:1
5-33a	131,200	83,200	214,400	58,100	3.69:1
Subtotal	3,020,900	1,615,500	4,636,400	1,299,600	
		Litt.	le River Syst	em	
5a-1	366,200	226,000	592,200	327,900	1.81:1
5 <b>a-</b> 5	423,300	101,500	524,800	295,500	1.78:1
5a-6	242,300	50,200	292,500	163,800	1.79:1
5a-7	645,000	272,000	917,000	241,700	3.79:1
5a-8	485,800	113,700	599,500	342,700	1.75:1
5a-9	190,700	90,100	280,800	121,100	2.32:1
5a-10	657,800	343,200	1,001,000	273,200	3.66:1
Subtotal	3,011,100	1,196,700	4,207,800	1,765,900	
		L' Ang	guille River		
5b <b>-</b> 2	97,600	59,900	157,500	61,100	2,58:1
Subtotal	97,600	59,900	157,500	61,100	
Total	6,129,600	2,872,100	9,001,700	3,126,600	

<sup>1/</sup> Current normalized prices.
2/ Average annual cost amortized over a 100-year period at 5-7/8 percent interest.

Appendix table VI-25--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, environmental plan, long range

CNI Wshd.	Watershed area	Corps of Eng. 100 yr. flood	Percent of Corps	Percent of watershed Corps SCS	Wet soils 1/ needing drainage	Benefited Corps	wet soils SCS	Other SCS benefited flood plain	Total SCS benefited area
			1 1 1	1 1	Acres	1	1	1	1 1 1 1
				St. Francia	St. Francis River Below Wappapello	pape110			
5-9	19,840	ήςς°9	33.03	16.99	8,200	2,708	5,492	200	5,692
5-10	70,144	29,786	42,46	57.54	16,940	7,193	9,747	•	9,747
5-12	021,60	22,27L	32.22	50.28	4L,096	13,241	27,855		27,855
5-15	206,080	143,777	69.77	30.23	177,247	123,665	53,582	•	53,582
5-15a	30,720	. 1	1	100,00	21,500	•	21,500	1	21,500
5-15b	7,44,800	1,0007	89.50	10.50	008° 1/1	960,04	402,4		†02° †
5-16	58,880	40,326	64.89	31.51	46,508	31,853	14,655	•	14,655
5-17	18,688	17,757	95.02	4.98	16,088	15,287	801		801
5-21	195,008	137,547	70.53	29.47	68,797	48,523	20,274	•	20,274
5-25	104,320	83,746	80.28	19.72	04,640	51,898	12,748	•	12,748
5-31	75,520	56.136	74.33	25.67	50.861	37,805	13,056		13,056
i,		20-60/		0	=0060/	Sone IC	2010-		0000
Subtotal	1,011,776	633,560			604,524	395,212	209,312	500	209,512
				II	Little River System				
5a-11 5a-12	126,080 83,200	62,506 74,467	47.64 89.50	52.36 10.50	117,900	56,168 53,599	61,732 6,288		61,732 6,288
Subtotal	209,280	136,973			177,787	109,767	68,020	1	68,020
Total	1,221,056	770,533			782,311	504,979	277,332	200	277,532

1/ Data source: Hydrologist data

Appendix table VI-26--Structure data - multiple purpose channels St. Francis River Basin, environmental plan, long range

Watershed Number	: : Channel : Improveme	:Drainage :	Drainage Area Controlled By Structures	: Stabilization	: : Weirs for : Habitat : Enhancement	: : Channel : Excavation
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yd.)
		St. Fr	ancis River Bel	ow Wappapello		
5-9 5-10 5-11 5-12 5-15 5-15 5-16 5-17 5-21 5-25 5-29	17 19 81 50 256 35 72 38 38 225 76 94	31.0 109.6 108.0 104.4 322.0 48.0 70.0 92.0 29.2 304.7 163.0 81.0 118.0	28.2 - - - - - - -	95 527 203 2,053 280 578 146 140 922 312 378 486	- 2 5 2 4 2 4 - 10 1 2	170,000 355,500 391,400 137,400 500,800 500,000 241,000 90,000 365,500 663,500 170,000 490,000 270,600
5-31 Subtotal	1,129	1,580.9	28.2	6,125	36	4,345,700
			Little River	System		
5a-11 5a-12	225 46	197.0 130.0	-	1,636 188	3 4	2,265,000 388,900
Subtotal	2 <b>7</b> 1	327.0	-	1,824	7	2,653,900
Total	1,400	1,907.9	28.2	7,949	43	6,999,600

Appendix table VI-27--Summary estimated structure cost distribution St. Francis River Basin, environmental plan, long range

St. Francis River Below Mappapello  3,726,400 465,100 481,000 4,672,500 0 1,400 74,000 116,000 4, 2,088,300 238,800 213,200 2,630,300 0 2,500 27,600 333,200 2, 2,088,300 26,900 21,2300 21,2300 2,5300 0 1,400 122,900 1,695,000 20,700 0 1,22,300 1,22,300 1,695,000 20,700 0 1,22,300 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1,900 1	Eeg I	: Installation : : : : : Construction: Eng	stion Cost - P::	P. L. 566 Fu : Project : g: admin. :	Funds : Total : P. L. 566	Instal		allation Cost - Other Further Project :Land, Ease-: admin. :ments & R/W:1	lation Cost - Other Funds  Project :Land, Ease-: Total admin. :ments & R/W:Nonfederal	Total Installation Cost
St. Francis River Below Wappapello  3,726,400 465,100 481,000 4,672,500 1,400 74,000 116,000 2,088,300 328,800 213,200 2,633,300 2,5600 327,600 333,200 225,900 20,900 21,200 2,130,300 2,5400 2,500 95,000 95,000 10,650,000 2,5400 31,300 2,5400 34,000 2,5400 34,000 34,000 34,000 34,000 11,650,000 2,5400 2,5400 31,300 2,5400 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000 34,000				1 i		ollars <u>1</u> /				
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669,000 72,500 152,300 833,800 203,000 7,300 94,000 304,300 1,000 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,500 0 1,50	5-10	2,088,300	(-)	213,200	2,630,300	1	2,600	327,600	333,200	2,963,500
252,900 26,900 56,300 309.100 75,400 2,500 45,000 122,900 55,300 309.100 75,400 2,500 45,000 122,900 56,500 31,500 42,200 2,317,900 55,700 19,600 95,000 669,700 568,000 1,560 10,600 10,800 10,900 10,400 12,000 11,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10	5-11	000,609	72,500	152,300	833,800	203,000	7,300	94,000	304,300	1,138,100
1,666,000 209,700 412,200 2317,900 555,100 19,600 95,000 669,700 556,000 31,500 31,500 34,700 2,400 254,000 31,500 31,500 31,500 31,500 31,800 34,000 25,000 256,000 19,900 10,700 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,00	5-12	225,900	26,900	56,300	309.100	75,400	2,500	45,000	122,900	432,000
254,500 31,500 54,000 740,000 54,700 2,000 38,300 95,000 139,300 139,500 138,000 138,000 138,000 139,500 139,500 138,000 139,000 139,500 156,000 139,000 139,500 156,000 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,600 127,6	5-15	1,696,000	209,700	412,200	2,317,900	555,100	19,600	92,000	669,700	2,987,600
568,000 67,800 138,000 773,800 178,700 6,400 84,000 269,100 139,000 146,500 1,600 30,000 78,100 130,000 130,800 191,700 4,200 34,800 191,700 4,200 34,800 1,643,100 349,800 12,400 10,500 255,100 2,000,200 248,100 289,800 2,538,100 106,600 4,400 43,500 154,500 260,100 121,800 685,200 175,100 57,000 520,800 228,800 2,138,100 110,200 6,000 52,000,200 248,100 289,800 2,138,100 110,200 6,000 22,000 220,800 137,600 799,200 170,200 6,000 52,000 223,200 223,800 2,129,400 79,100 1,111,100 3,319,600 32,319,600 3243,200 228,500 477,600 2,624,700 634,300 2,600 137,500 794,400 2,141,400 2,28,500 2,93,400 2,93,800 704,500 2,500 104,300 1,275,600 4,213,800 3,100 2,100 1,211,00 1,215,600 4,213,800 3,100 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600	5-15a	254,500	31,500	54,000	340,000	54,700	2,000	38,300	95,000	435,000
139,500 16,600 34,800 190,900 46,500 1,600 30,000 78,100 170,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1	5-15b	568,000	67,800	138,000	773,800	178,700	6,400	84,000	269,100	1,042,900
813,100 157,700 92,700 1,063,500 191,700 4,200 59,200 255,100 1,070,600 127,600 264,900 1,463,100 105,600 12,400 43,500 12,000,24,100 248,100 289,800 2,500,200 4,400 43,500 120,500 200,248,100 289,800 2,500,200 137,100 5,700 43,500 122,600 220,800 220,800 220,800 20,200,200 1,083,200 121,800 685,200 177,100 5,700 58,000 228,200 228,200 170,200 6,000 52,000 228,200 228,200 18,617,400 2,129,400 79,100 1,111,100 3,319,600 228,200 243,200 228,500 477,600 2,624,700 634,300 22,600 137,500 794,400 243,200 22,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 21,161,800 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,800 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 2,943,900 104,300 1,275,600 4,213,800 2,943,800 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,900 2,943,	5-16	139,500	16,600	34,800	190,900	46,500	1,600	30,000	78,100	269,000
1,070,600 127,600 264,900 1,463,100 349,800 12,400 110,500 472,700 2,000,200 248,100 289,800 2,538,100 106,600 4,400 43,500 154,500 154,500 593,300 60,100 121,800 685,200 157,100 5,700 58,000 220,800 121,800 137,600 1799,200 170,200 57,000 52,000 228,200 121,883,200 2,448,600 18,617,400 2,129,400 79,100 1,111,100 3,319,600 243,200 228,500 477,600 2,624,700 634,300 22,600 137,500 99,800 1437,200 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 166,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 20,400 104,300 1,275,600 4,213,800 2,400 104,300 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1,275,600 1	5-17	813,100	157,700	92,700	1,063,500	191,700	4,200	59,200	255,100	1,318,600
2,000,200 248,100 289,800 2,538,100 106,600 4,400 43,500 154,500 50,800 50,300 60,100 121,800 685,200 157,100 5,700 58,000 220,800 220,800 590,800 1,883,200 2,448,600 18,617,400 2,129,400 79,100 1,111,100 3,319,600 34,300 2,28,500 1,883,200 2,624,700 634,300 2,600 137,500 794,400 2,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 34,400 2,140,800 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 3,900 104,300 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,600 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 1,275,100 4,213,800 3,900 4,213,100 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,213,800 4,	5-21	1,070,600	127,600	264,900	1,463,100	349,800	12,400	110,500	472,700	1,935,800
593,300 60,100 121,800 685,200 157,100 5,700 58,000 220,800 520,800 590,800 70,800 137,600 799,200 170,200 6,000 52,000 228,200 228,200 1,883,200 2,448,600 18,617,400 2,129,400 79,100 1,111,100 3,319,600 31,918,600 228,500 477,600 2,624,700 634,300 22,600 137,500 99,800 243,200 25,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 24,600 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,200 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 104,300 1,275,600 4,213,800 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,900 21,571,500 2,833,	5-25	2,000,200	248,100	289,800	2,538,100	106,600	4,400	43,500	154,500	2,692,600
14,285,600 1,883,200 2,448,600 18,617,400 2,129,400 79,100 1,111,100 3,319,600 1,918,600 228,500 477,600 2,624,700 634,300 2,600 137,500 99,800 2,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2,885. 1970	5-29	503,300	60,100	121,800	685,200	157,100	5,700	58,000	220,800	906,000
1,918,600 228,500 477,600 2,624,700 634,300 2,600 137,500 99,800 2,161,800 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2	5-31	590,800	70,800	137,600	799,200	170,200	6,000	52,000	228,200	1,027,400
Little River System  243,200 228,500 477,600 2,624,700 634,300 22,600 137,500 794,400  btotal  2,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200  otal  16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2  Price Rec. 1970	Subtotal	14,285,600	1,883,200	2,448,600	18,617,400	2,129,400	79,100	1,111,100	3,319,600	21,937,000
Little River System  1,918,600 228,500 477,600 2,624,700 634,300 22,600 137,500 794,400  btotal 2,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200  otal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2  Price Rec. 1970										
-11 1,918,600 228,500 477,600 2,624,700 634,300 22,600 137,500 794,400 99,800 btotal 2,161,800 257,600 534,400 2,953,800 704,500 25,200 164,500 894,200 ctal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2 Price Reserving					Litt	le River Syste	Œ.I			
btotal 2,161,800 257,600 534,400 2.953,800 704,500 25,200 164,500 894,200 3, otal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 25,	5a-11 5a-12	1,918,600 243,200	228,500	477,600	2,624,700	634,300	22,600	137,500	794,400	3,419,100
btotal 2,161,800 257,600 534,400 2.953,800 704,500 25,200 164,500 894,200  otal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800 2  Price Reserving			,						200	
otal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800	Subtotal	2,161,800	257,600	534,400	2,953,800	704,500	25,200	164,500	894,200	3,848,000
otal 16,447,400 2,140,800 2,983,000 21,571,200 2,833,900 104,300 1,275,600 4,213,800										
Price Bace.	Total	16,447,400	2,140,800	2,983,000	21,571,200	2,833,900	104,300	1,275,600	4,213,800	25,785,000
	Drice Bace.									

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Appendix table VI-28--Total installation and annual costs St. Francis River Basin, environmental plan, long range

:		: Amortization	: Operation	:
:	Total	: of	: and	:
atershed :	Installation	: Installation	: Maintenance	:
Number :	Cost	: Cost 1/	: Cost 2/	: Total
		dollars-		
	St. Fra	ncis River Below Wapps	apello Reservoir	
5-9	4,788,500	329,600	42,600	372,200
5-10	2,963,500	204,000	11,900	215,900
5-11	1,138,100	78,300	24,100	102,400
5-12	432,000	29,700	15,100	44,800
5-15	2,987,600	205,600	76,900	282,500
5-15a	435,000	29,900	14,500	44,400
5-15b	1,042,900	71,800	22,400	94,200
5-16	269,000	18,500	13,800	32,300
5-17	1,318,600	90,800	13,600	104,400
5-21	1,935,800	133,200	68,300	201,500
5-25	2,692,600	185,300	103,400	288,700
5-29	906,000	62,400	29,400	91,800
5-31	1,027,400	70,700	33,200	103,900
Subtotal	21,937,000	1,509,800	469,200	1,979,000
		Little River Sys	stem	
5a-11	3,419,100	235,300	67,400	302,700
5a-12	428,900	29,500	14,900	44,400
Subtotal	3,848,000	264,800	82,300	347,100
Total	25,785,000	1,774,600	551,500	2,326,100

<sup>1/</sup> Price Base: 1970. Instillation costs amortized over a 100-year period at 6-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100year life.

Appendix table VI-28a--Total installation and annual costs St. Francis River Basin, environmental plan, long range

Watershed : Number :	Total Installation Cost	Amortization of Installation Cost 1	Operation and Maintenance Cost 2	: Total
	St. Fran	cis River Below Wappap	ello Reservoir	
5-9 5-10 5-11 5-12 5-15 5-15a 5-15b 5-16 5-17 5-21 5-25 5-29 5-31	4,788,500 2,963,500 1,138,100 432,000 2,987,600 435,000 1,042,900 269,000 1,318,600 1,935,800 2,692,600 906,000 1,027,400	282,300 174,700 67,100 25,500 176,100 25,600 61,500 15,900 77,700 114,100 158,700 53,400 60,600	42,600 11,900 24,100 15,100 76,900 14,500 22,400 13,800 13,600 68,300 103,400 29,400 33,200	324,900 186,600 91,200 40,600 253,000 40,100 83,900 29,700 91,300 182,400 262,100 82,800 93,800
Subtotal	21,937,000	1,293,200	469,200	1,762,400
		Little River Syst	em_	
5a-11 5a-12	3,419,100 428,900	201,600 25,300	67,400 14,900	269,000 40,200
Subtotal  Total	3,848,000 25,785,000	1,520,100	82,300 551,500	2,071,600

Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100year life.

Appendix table VI-29--Estimated annual damages and benefits St. Francis River Basin, environmental plan, long range

Ctoppe_and Pasture   Other   Roads &   Other   Other   Roads &   Other   Other   Roads &   Other   O
Action   Color   Col
## Sture   Str.   Str.
: Crops and : : Irrigated:

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Appendix table VI-29 (cont.)--Estimated average annual damages and benefits  $\underline{1}/$ St. Francis River Basin, environmental plan, long range

Water- shed	Crops and pasture Non- Irrigated: irrigated	pasture : Non- : irrigated :	Other : agri. :	Road & : bridges :	Urban : d	Overbank : pdeposition : s	Flood-: plain : scour :	Subtotal :	Indirect:	Total	Drainage
						Little River System  Estimated average annual damages $\frac{2}{}$	System nual damag	3es <u>2</u> /			
5a-11 5a-12	91,200	634,500 161,000	41,000	7,600	- 1	1 1	1 1	774,300	77,400	851,700 196,800	1 1
Total	98,000	795,500	50,300	9,400	1	ı	ı	953,200	95,300	1,048,500	ı
Basin total	504,300	4,312,200	273,600	63,700	2,900	32,300	10,400	10,400 5,199,400	519,900	5,719,300	1
				щ	Stimated	Estimated average annual benefits $\underline{3}/$	ual benefi	its <u>3</u> /			
5a-11 5a-12	47,100	335,700 86,100	32,800 7,400	6,800	1 1	1 1	1 1	422,400 98,800	42,200	464,600 108,700	238,700 32,100
Total	50,800	421,800	40,200	8,400	1	1	ı	521,200	52,100	573,300	270,800
Basin total	263,300	2,341,400	221,000	55,500	2,500	20,700	7,000	7,000 2,911,400	291,300	3,202,700	1,300,000

Without additional federal assistance. 1974 current normalized prices. 14/3/2/17

With PL-566 assistance.

Incidental recreation.

Appendix table VI-30--Comparison of benefits and costs for structural measures St. Francis River Basin, environmental plan, long range

Watersheds	: Average Annual Benefits 1/ : :  : : Agricultural: : Average : Benefit : Damage : Water : : Annual : To Cost : Reduction: Management : Total : Cost 2/ : Ratio
	St. Francis River Below Wappapello Reservoir
5-9 5-10 5-11 5-12 5-15 5-15a 5-15b 5-16 5-17 5-21 5-25 5-29 5-31	38,200 26,000 64,200 372,200 0.17:1 247,500 15,000 3/ 262,500 215,900 1.21:1 218,400 142,500 360,900 102,400 3.52:1 177,100 102,000 279,100 44,800 6.22:1 543,600 211,800 755,400 282,500 2.67:1 91,200 64,400 155,600 44,400 3.50:1 130,600 21,500 152,100 94,200 1.61:1 272,700 88,400 361,100 32,300 11.17:1 108,500 70,400 178,900 104,400 1.71:1 320,700 121,400 442,100 201,500 2.19:1 196,900 58,500 255,400 288,700 0.88:1 92,300 49,600 141,900 91,800 1.54:1 191,700 72,700 264,400 103,900 2.54:1
Subtotal	2,629,400 1,029,200 3,658,600 1,979,000 15,000 3/ 15,000 3/
	· · · · · · · · · · · · · · · · · · ·
	Little River System
5a-11 5a-12	464,600       238,700       703,300       302,700       2.32:1         108,700       32,100       140,800       44,400       3.17:1
Subtotal	573,300 270,800 844,100 347,100
Total	3,202,700 1,315,000 4,517,700 2,326,100

<sup>1/ 1974</sup> current normalized prices.

Average annual cost amortized over a 100-year period at 6-7/8 percent interest.

<sup>3/</sup> Incidental recreation.

Appendix table VI-30a--Comparison of benefits and costs for structural measures St. Francis River Basin, environmental plan, long range

Watersheds	: Average Annual Benefits 1/: : : : : : : : : : : : : : : : : : :
	St. Francis River Below Wappapello Reservoir
5-9 5-10 5-11 5-12 5-15 5-15a 5-15b 5-16 5-17 5-21 5-25 5-29 5-31	38,200 26,000 64,200 324,900 0.20:1 247,500 15,000 3/ 262,500 186,600 1.41:1 218,400 142,500 360,900 91,200 3.96:1 177,100 102,000 279,100 40,600 6.87:1 543,600 211,800 755,400 253,000 2.99:1 91,200 64,400 155,600 40,100 3.88:1 130,600 21,500 152,100 83,900 1.81:1 272,700 88,400 361,100 29,700 12.16:1 108,500 70,400 178,900 91,300 1.96:1 320,700 121,400 442,100 182,400 2.42:1 196,900 58,500 255,400 262,100 0.97:1 92,300 49,600 141,900 82,800 1.71:1 191,700 72,700 264,400 93,800 2.82:1
Subtotal	2,629,400 1,029,200 3,658,600 1,762,400 15,000 3/1,762,400
	Little River System
5a-11 5a-12	464,600 238,700 703,300 269,000 2.61:1 108,700 32,100 140,800 40,200 3.50:1
Subtotal	573,300 270,800 844,100 309,200
Total	3,202,700 1,315,000 4,517,700 2,071,600

 $<sup>\</sup>frac{1}{2}/$  1974 current normalized prices. Average annual cost amortized over a 100-year period at 5-7/8 percent interest.

<sup>3/</sup> Incidental recreation.

Appendix table VI-31--Distribution or wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, environmental plan, not feasible for PL-566

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5-74				••	Wet Soils	<i></i>	•••	: Other SCS :	Total SCS
CNI Watershed Number	: Watershed:C	:Corps of Eng.:Percent of Watershed: :100 Yr. Flood: Corps : SCS :	Percent of Corps	Watershed: SCS	Needing Drainage	Benefited Wet: Corps:	Soil SCS	Soils:Benefited: SCS:Flood Plain:	Benefited Area
					- ACRES				
				St. Francis	River Above	River Above Wappapello			
5-1	223,360	ı	1	100.00	ı	ı	1	ı	ı
5-2	88,960	ı	1	100.00	ı	1	1	1	ı
5-3	173,440	ı	1	100.00	1	1	ı	1	ı
5-4	126,080		1	100.00	1	i	ł	1	ł
5-5	195,840	ı	1	100.00	1	1	1	ı	1
5-5a	30,720	-	_	100.00	ŀ	1		1	ı
Subtotal	838,400	I	ı		1	ł	1	ı	1
			ΩI	St. Francis	Francis River Below Wappapello	Wappape11o			
$5-20\frac{2}{}$	80,640	53,730	66.63	33.37	80,570	1	ı	ı	ı
$5-23 \frac{2}{}$	119,040	49,285	41.40	58.60	39,338		ı	1	ı
5-24	87,040	77,903	89.50	10.50	64,097	57,367	0	1	0
5-28	90,880	81,111	89.25	10.75	59,219	52,853	0	1	0
5-30	992,999	59,573	89.50	10.50	36,518	32,684	0	1	0
5-32	49,280	43,534	88.34	11.66	32,402	28,624	0	1	0
5-34	94,080	83,631	88.89	11.11	48,365	42,992	0	1	0
5-35	27,520	13,037	47.37	52.63	6,849	4,665	0	1	0
5-35a	16,000	1,053	6.58	93.42	5,106	336	0	-	0
Subtotal	631,040	462,857			375,464	219,521	0	ı	0

 $\frac{1}{2}$ / Data Source: Hydrologist Data.  $\frac{2}{2}$ / Floodway.

Appendix table VI-31 (cont,)--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, Arkansas and Missouri, environmental plan, not feasible for PL-566

4-33992

CNI Watershed Number : "Matershed:Corps of Eng.:Percent of Watershed: "Needing : Benefited Wet Soils of Scs : Drainage : Corps : SCS : Drainage : SCS : Drai	4					Mot Soils	/:	Other SOS	SCS . Total SCS
Little River System  8,960 8,960 100.00	cNI Watershed Number	:Watershed:(	Corps of Eng.	: Percent of Corps	Watershed:	0 00		Soils SCS	in:
S,960   8,960   100.00     -   -   -   -   -   -   -						ACRE			
24, 960 8,960 100.00					Litt	cle River S	stem		
Fal. (a) 6,600 (a) 34,3 (b) 6,43 (b) 6,43 (b) 6,43 (c) 6,	5a-0 2/	8,960	8,960	100.00	1	1	1		ı
13/4 (43,520 31,643 89.50 10.50 23,050	5a-3	009,6	343	3.57	96.43	2,570	92		0
1. Anguille River 23,680 13,275 56.06 43.94 16,567 9,287 0 44,160 10,418 23.59 76.41 27,261 6,431 0 31,360 2,876 9.17 90.83 27,251 2,499 0 56,320 8,732 15.50 84.50 35,504 5,503 0 42,240 1,827 3.21 96.79 46,471 1,492 0 56,960 11,466 15.58 84.42 54,962 8,563 0 71,680 11,466 15.58 84.42 54,962 8,563 0 57,600 31,151 18.35 81.65 61.690 11,320 0 57,600 12,698 118.35 81.65 51.075 5,117 0 52,037,760 603,671 370,023 70,774 0	$5a-11a \frac{3}{2}$	24,960	22,340	89.50	10.50	23,050	1		-
23,680 13,275 56.06 43.94 16,567 9,287 0 44,160 10,418 23.59 76.41 27,261 6,431 0 31,360 2,876 9,17 90.83 27,251 2,499 0 56,320 8,732 15.50 84.50 35.504 5,503 0 42,240 3,514 8,32 91.68 41,700 3,469 0 73,600 11,466 15.58 84.42 54,962 8,563 0 71,680 13,151 18.35 81.65 61,690 11,320 0 57,600 31,214 54.19 45.81 31,542 17,093 0 67,200 12,698 18.90 81.10 27,075 5,117 0 2,037,760 603,671 771,107 290,387 0	Subtotal.	43,520	3I,643			25,620	92		0
23,680 13,275 56.06 43.94 16,567 9,287 0 44,160 10,418 23.59 76.41 27,261 6,431 0 31,360 2,876 9.17 90.83 27,251 2,499 0 56,320 8,732 15.50 84.50 35,504 5,503 0 42,240 3,514 8.32 91.68 41,700 3,469 0 56,960 1,827 3.21 96.79 46,471 1,492 0 73,600 11,466 15.58 84.42 54,962 8,563 0 57,600 31,214 54.19 45.81 31,542 17,093 0 67,200 12,698 18.90 81.10 27,075 5,117 0 2,037,760 603,671 771,107 290,387 0					L'1	Anguille Ri	7er		
44,160     10,418     23.59     76.41     27,261     6,431     0       31,360     2,876     9.17     90.83     27,251     2,499     0       56,320     8,732     15.50     84.50     35,504     5,503     0       42,240     3,514     8,32     91.68     41,700     3,469     0       56,960     1,827     3.21     96.79     46,471     1,492     0       73,600     11,466     15.58     84.42     54,962     8,563     0       57,600     31,214     54.19     45.81     11,320     0       67,200     12,698     18.90     81.10     27,075     5,117     0       2,037,760     603,671     771,107     290,387     0	5b-1	23,680	13,275	56.06	43.94	16,567	9,287		0
31,360 2,876 9.17 90.83 27,251 2,499 0 56,320 8,732 15.50 84.50 35,504 5,503 0 56,320 8,732 15.50 84.50 35,504 5,503 0 56,960 1,827 3.21 96.79 46,471 1,492 0 73,600 11,466 15.58 84.42 54,962 8,563 0 57,600 31,214 54.19 45.81 31,542 17,093 0 57,600 12,698 18.90 81.10 27,075 5,117 0 2,037,760 603,671 771,107 290,387 0	5b-3	44,160	10,418	23.59	76.41	27,261	6,431		0
56,320 8,732 15.50 84.50 35,504 5,503 0 42,240 3,514 8.32 91.68 41,700 3,469 0 56,960 1,827 3.21 96.79 46,471 1,492 0 73,600 11,466 15.58 84.42 54,962 8,563 0 57,600 31,214 54.19 45.81 31,542 17,093 0 57,600 12,698 18.90 81.10 27,075 5,117 0 220,37,760 603,671 771,107 290,387 0	5b-4	31,360	2,876	9.17	90.83	27,251	2,499		0
tal 42,240 3,514 8.32 91.68 41,700 3,469 0 56,960 1,827 3.21 96.79 46,471 1,492 0 73,600 11,466 15.58 84.42 54,962 8,563 0 57,600 31,214 54.19 45.81 31,542 17,093 0 67,200 12,698 18.90 81.10 27,075 5,117 0 2,037,760 603,671 771,107 290,387 0	5b-5	56,320	8,732	15.50	84.50	35,504	5,503		0
Eal 56,960 1,827 3.21 96.79 46,471 1,492 0 73,600 11,466 15.58 84.42 54,962 8,563 0 71,680 13,151 18.35 81.65 61,690 11,320 0 57,600 31,214 54.19 45.81 31,542 17,093 0 67,200 12,698 18.90 81.10 27,075 5,117 0 22,037,760 603,671 771,107 290,387 0	5b-6	42,240	3,514	8.32	91.68	41,700	3,469		0
tal 524,800 11,466 15.58 84.42 54,962 8,563 0 71,680 13,151 18.35 81.65 61,690 11,320 0 57,600 31,214 54.19 45.81 31,542 17,093 0 67,200 12,698 18.90 81.10 27,075 5,117 0 22,037,760 603,671 771,107 290,387 0	5b-7	26,960	1,827	3.21	96.79	46,471	1,492		0
tal $524,800$ $13,151$ $18.35$ $81.65$ $61,690$ $11,320$ $0$ $57,600$ $31,214$ $54.19$ $45.81$ $31,542$ $17,093$ $0$ $67,200$ $12,698$ $18.90$ $81.10$ $27,075$ $5,117$ $0$ $0$ $109,171 18.90 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107 11,107$	5b-9	73,600	11,466	15.58	84.42	54,962	8,563		0
tal $57,600$ $31,214$ $54.19$ $45.81$ $31,542$ $17,093$ $0$ $67,200$ $12,698$ $18.90$ $81.10$ $27,075$ $5,117$ $0$ $0$ $109,171 100,023 100,774 100,023 100,774 100,023 100,774 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,023 100,02$	5b-10	71,680	13,151	18.35	81.65	61,690	11,320		0
tal 67,200 12,698 18.90 81.10 27,075 5,117 0 524,800 109,171 370,023 70,774 0 2,037,760 603,671 771,107 290,387 0	5b-11	27,600	31,214	54.19	45.81	31,542	17,093		0
tal 524,800 109,171 370,023 70,774 0 2,037,760 603,671 771,107 290,387 0	5b-12	67,200	12,698	18.90	81.10	27,075	5,117		0
2,037,760 603,671 771,107 290,387 0	Subtotal	524,800	109,171			370,023	70,774		0
	Total	2,037,760	603,671			771,107	290,387	0 0	0

Data Source: Hydrologist Data. 13/2/1

Floodway. Wildlife.

## Appendix table VI-32--Structure data - multiple-purpose channels St. Francis River Basin, environmental plan, not feasible for PL-566

	: Channel		Drainage Are	a: Grade :Stabilizatio	: Weirs for : n: Habitat :	Channe1
Watershed Number	:Improvement			s: Structures		
Watershed Number	(Miles)		(Sq. Mi.)	(Number)	(Number)	(Cu. Yd.)
	(HITES)	(5q. HI.)	(5q. MI.)	(Number)	(Mumber)	(ca. 1a.).
		St.	Francis Riv	er Above Wappa	pello	
5-1		349.0		_	_	
5-2	_	139.0		_	_	_
5-3	_	271.0	_	_	_	_
5-4	_	197.0	_	_	_	_
5-5	_	306.0	_	_	_	_
5-5a	_	48.0	_	_	_	_
<i>y</i> 20					<del></del>	
Subtotal	-	1,310.0	-	-	-	-
		St.	Francis Riv	er Below Wappa	pello	
5-20	_	126.0	_	_	_	_
5-23	_	186.0	_	_	_	_
5-24	_	136.0	_	_	_	_
5-28	_	142.0	_	_	_	_
5-30	_	104.0	_	_	_	_
5-32	_	77.0	_	_	_	_
5-34	_	147.0	_	_	_	_
5-35	_	43.0	_	_	_	_
5-35a		25.0	<u> </u>	<u>-</u>		_
Subtotal	-	986.0	-	-	-	-
			<u>Little R</u>	iver System		
5a-0	_	14.0	_	_	_	_
5a-3	_	15.0	_	_	_	_
5a-11a	_	39.0	_	_	-	_
Subtotal		68.0	_			
Jublocai	_	00.0	_	_	_	_
			L'Angui	lle River		
5b-1	_	37.0	_		-	_
5b-3	-	69.0		-	-	-
5b-4	-	49.0	-	-	-	-
5b-5	-	88.0	-	-	-	-
5b-6	-	66.0	-	-	-	-
5b-7	-	89.0	-	-	-	-
5b-9	-	115.0	-	-	-	-
5b-10	-	112.0	-	-	-	-
5b-11	-	90.0	-	-	-	-
5b-12		105.0		-	<del>-</del>	
Subtotal	-	820.0	-	-	-	-
Total	_	3,184.0				
	-	3.184.0	_	_	-	-

Appendix table VI-33--Present and projected forest land under the baseline projection and alternatives, St. Francis River Basin, year 2000

		Alternatives	
	Baseline projection	(B) Economic	(C) Environmental
		acres	
Present forest - 1969	985,000	985,000	985,000
Clearing for:	111,600	116,000	116,000
Crops	100,400	104,400	104,400
Pasture	6,200	6,200	6,200
Urban	5,000	5,000	5,000
Floodwater retarding			
structures	0	400	400
Planting	0	3,900	6,200
Projected forest - 2000	873,400	872,900	875,200
Noncommercial	37,200	37,200	37,200
Commercial	836,200	835,700	838,000
Wildlife development	65,500	66,200	152,500
Recreation development	4,800	4,900	18,100
Timber production 1/	831,400	830,800	819,900

 $<sup>\</sup>underline{1}$ / Commercial forest minus recreation development.

Appendix table VI-34--Forest management practices under the baseline projection and alternatives, St. Francis River Basin, year 2000

					Alternatives	atives		
	Unit	Quantities needed 1/	Baseline provides	Baseline projection provides remaining	(B) Economic provides rem	(B) Economic provides remaining	(C) Environmental provides remai	mental remaining
Forest management plans	acres	691,000	150,000	541,000	271,200	419,800	271,200	
Critical area stabilization Tree planting Logging roads and skid trails Grazing removals	acres acres	13,200 2/ 78,800	0 118,300 15,700	13,200 0 63,100	13,200 117,200 29,800	000,64	13,200 112,600 43,800	35,000
Tree planting	acres	51,600	15,700	35,900	23,700	27,900	22,100	29,500
Timber stand improvement	acres	373,100	95,900	277,200	160,200	212,900	122,100	251,000

 $\frac{1}{2}/$  See table IV-8.  $\frac{2}{2}/$  Total acres meeding stabilization will vary under each alternative.

Appendix table VI-35--Annual timber growth and product yield under the baseline projection and alternatives, St. Francis River Basin, years 1980, 2000, and 2020

		seline jection <u>l</u> /		natives (B) omic 2/		(C) ronmental 2/
Year	Annual growth	Product 3/ yield	Annual growth	Product 3/ yield	Annual growth	Product 3/ yield
1980	36.8	24.2	- Cubic fee 36.8	et per acre 24.2	32.9	21.4
2000	42.8	36.4	47.1	40.0	40.6	34.5
2020	49.2	46.7	55.8	53.0	47.1	44.7

Appendix table VI-36--Timber product needs and supply under the baseline projection and alternatives, St. Francis River Basin, year 2000

Plan	Needs 1/	Supply 2/	Unsatisfied needs
Baseline projection	35	Million cubic	feet
Economic alternative (B)	35	31	4
Environmental alternative (C)	35	24	11

<sup>1/</sup> OBERS table IV-2.

<sup>1/</sup> Current level of management.
2/ High level of management.
3/ Product yield - the growth available for products is a percentage of the net annual growth: 1980 - 66 percent; 2000 - 85 percent; 2020 - 95 percent.

<sup>2/</sup> Includes saw and veneer logs, miscellaneous wood products, pulpwood and fuelwood.

Appendix table VI-37--Estimated average annual gross erosion and sediment yield from forest land by conditions under the baseline projection and alternatives, St. Francis River Basin, year 2000

Forest conditions		Alternatives	
and problems	Baseline projection	(B) Economic	(C) Environmental
		Tons per year -	
ross erosion			
Undisturbed	288,800	294,800	308,800
Disturbed 1/	663,900	536,300	428,300
Total	952,700	831,100	737,100
ediment yield			
Undisturbed	2,000	2,000	2,100
Disturbed 1/	74,100	60,300	45,000
Total	76,100	62,300	47,100

<sup>1/</sup> Includes logging areas, skid trails, logging roads, fire, and grazing. Treatment of skid trails, logging roads, and grazing expected to be done under the Federal Water Pollution Control Act Amendments of 1972.

Appendix table VI-38--Estimated forest practices cost under the baseline projection and alternatives, St. Francis River Basin, year 2000

		Alternatives	
Practices	Baseline projection	(B) Economic	(C) Environmental
		Million dollars 1	/
Tree planting Critical Inter and other	0.6	5.5 1.0	5.5 0.9
Pimber stand improvement	2.7	4.0	2.5
Grazing exclusion 2/	1.7	3.4	4.9
Logging roads and skid trails 2/	9.7	9.5	9.3
Technical assistance	0.6	1.2	1.1
Total	15.3	24.6	24.2

<sup>1/</sup> Price Base: 1970.

<sup>2/</sup> Treatment under the Federal Water Pollution Control Act Amendments of 1972.

Appendix table VI-39--Additional forest land needed to satisfy timber production needs under the baseline projection and alternatives, St. Francis River Basin, year 2000

Plan	Additional forest land
	Acres
Baseline projection	192,000
Economic alternative (B)	100,000
Environmental alternative (C)	319,000

Appendix table VI-40--Forest employment and income under the baseline projection and alternatives, St. Francis River Basin, year 2000

77.00	and amplement	Unit		Alternatives	1
ror	est employment	Unit	Baseline projection	(B) Economic	(C) Environmental
	treatment practices technical assistance				
a.	Number	man-years	734	926	975
ъ.	Income	million dollars	6.4	7.2	7.1
ores	t management.				
pro	t management, tection, and lustries	man-years	1,000	1,135	880
pro	tection, and lustries	man-years million dollars	1,000	1,135 7.3	880 5.6
pro ind	tection, and dustries Number Income	million	•	,	
proind a. b.	tection, and dustries Number Income	million	•	,	



APPENDIX TABLES - CHAPTER VII

Recommended Plan



Appendix table VII-1--Distribution of wet soils and other benefited flood plain by watersheds St. Francis River Basin, recommended plan, short range (10-15 years)

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CNI Watershed No.	Watershed : area :	Corps of Eng.	Percent of Corps :	of Watershed :	Wet Soils 1/ Needing Drainage	Benefited Wet Soils Corps : SCS	Wet Soils :	Other SCS :'benefited : flood plain:	: Total SCS :benefited : area
	 			 Francis	- Acres River Below Wappapello		1 1 1 1 1 1 1 1		1 1 1 1
5-7	216,960	84,548	38.97	61.03	96,300	37,528	58,772	4,073	62,845
5-8	58,880	7,859	13.35	86.65	19,800	2,643	17,157	ı	17,157
5-11a	26,880	5,728	21.31	78.69	1:5,200	3,239	11,961	ı	11,961
5-13	136,960	24,173	17.65	82.35	47,065	8,307	38,758	4,500	43,258
5-14	49,920	9,347	18.72	81.28	21,193	3,967	17,226	35	17,261
5-26	62,720	51,209	81.65	18.35	48,127	39,296	8,831	1	8,831
5-27	62,720	. 1	1	100.00	41,030	. 1	41,030	ı	41,030
5-33a	36,224	20,851	57.56	42.44	23,307	13,416	9,891	_	9,891
Subtotal	651,264	203,715			312,022	108,396	203,626	8,608	212,234
				Little	Little River System				
5a-1	150,400	59,229	39.38	60.62	105,800	41,664	64,136	2,562	66,698
5a-5	118,400	· 1	ı	100.00	33,828	١.	33,828	6,142	39,970
5a-6	85,120	72,175	84.16	15.84	59,300	49,907	9,393	09	9,453
5a-7	195,200	120,864	61.92	38.08	131,300	81,301	49,999	120	50,119
5a-8	184,960	154,374	82.61	17.39	104,200	86,080	18,120	200	18,320
5a-9 5a-10	129,280 197,120	79,049 103,108	60.55 52.31	39.45 47.69	47,800 112,340	28,943 58,765	18,857 53,575	1 1	18,857 53,575
Subtotal	1,060,480	588,799			594,568	346,660	247,908	9,084	256,992
				L'Ang	L'Anguille River				
5b-2	35,840	8,137	22.70	77.30	23,591	5,355	18,236	ı	18,236
Subtotal	35,840	8,137			23,591	5,355	18,236	1	18,236
Total	1,747,584	800,651			930,181	460,411	469,770	17,692	487,462

 $\underline{1}$ / Data Source: Hydrologist data.

Appendix table VII-2--Structure data - multiple-purpose channels St. Francis River Basin, recommended plan, short range (10-15 years)

	:		rainage Area		: Weirs for	:
	: Channel			:Stabilization		: Channel
Watershed Number		t: Area :B	y Structures	: Structures		: Excavation
	(Miles)	(Sq. Mi.)	(Sq. Mi.)	(Number)	(Number)	(Cu. Yds.)
			St. Franci	s River Below	Wappapello	
5-7	58	339.0	12.7	491	4	377,600
5-8	45	92.0	-	243	3	162,500
5-11a	36	42.0	_	292	-	196,100
5-13	51	214.0	28.8	210	1	225,200
5-14	37	78.0	1.7	150	4	220,000
5-26	89	98.0	_	355	9	536,200
5-27	67	98.0	-	267	2	207,500
5 <b>-</b> 33a	35	56.6	-	152	2	754,600
Subtotal	418	1,017.6	43.2	2,160	25	2,679,700
			Li	ttle River Sys	tem	
5a-1	153	235.0	11.1	1,224	11	367,800
5a-5	50	185.0	13.8	422	1	390,800
5a-6	95	133.0	5.2	759	4	330,500
5a-7	188	305.0	1.2	1,504	6	1,482,400
5a-8	229	289.0	3.9	1,835	29	2,197,000
5a-9	105	202.8	_	849	6	226,200
5a-10	256	308.0	-	2,418	12	1,236,400
Subtotal	1,076	1,657.8	35.2	9,011	69	6,231,100
			<u>I</u>	'Anguille Rive	<u>r</u>	
5b-2	48	56.0	-	200	-	938,100
Subtotal	48	56.0	_	200	_	938,100
Total	1,542	2,731.4	78.4	11,371	94	9,848,900

Appendix table VII-3--Summary estimated structure cost distribution 1/St. Francis River Basin, recommended plan, short range (10-15 years)

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5-7 5-8 5-11a 5-13 5-14 5-26 5-27 5-33a Subtotal	2,263,100							a IV weight cactar	Cost
5-7 5-8 5-11a 5-13 5-14 5-26 5-27 5-33a Subtotal	2,263,100 307,500			Below Wap	Below Wappapello Reservoir	rvoir			
5-8 5-13 5-13 5-14 5-26 5-27 5-33a Subtotal	307,500	215 500	002 657	2 937 800	164 000	21 800	297 500	008 887	3 421 100
5-11a 5-11a 5-14 5-26 5-27 5-33a Subtotal	000,000	36 400	81,600	7,75,500	117,800	200,17	37,000	156,000	7,421,100
5-13 5-14 5-26 5-27 5-33a Subtotal	008 790	31,400	67,700	363 900	002 300	3,400	37,000	115 600	701,300
5-14 5-26 5-27 5-33a Subtotal	3 167 900	200,400	611,100	700,500	92,200	20,400	576,000	700,611	759 700
5-26 5-27 5-33a Subtotal	377,600	39,800	83 500	. 000,690,4	63,000	3,400	72,000	144 000	644 900
5-27 5-33a Subtotal	396,600	46,600	110,600	553,800	160,300	5,900	62,000	228,200	782,000
Subtotal	143,400	16,800	41,200	201,400	62,000	2,300	35,000	99,300	300,700
Subtotal	403,300	43,000	33,400	344,300	104,000	4,300	143,/00	233,400	191,100
	7,324,800	722,100	1,550,300	9,597,200	849,800	75,600	1,243,200	2,168,600	11,765,800
				Little	River System	ДI			
,								,	
5a-1	2,683,700	268,900	580,400	3,533,000	364,800	28,300	248,000	641,100	4,174,100
5a-5	2,547,300	239,700	507,200	3,294,200	148,600	24,200	402,000	574,800	3,869,000
3a-6	1,212,700	125,900	274,500	1,613,100	226,900	13,600	85,000	325,500	1,938,600
5a-/	1,690,700	192,500	420,900	2,304,100	515,600	20,800	29,000	565,400	2,869,500
7210	695 500	82 300	187, 700	3,292,300	759 600	90,100	30,300	317, 700	1 276 600
5a-10	1,602,400	189,500	426,100	2,218,000	602,600	21,400	208,000	832,000	3,050,000
Subtotal	12,851,200	1,368,600	2,997,100 17,216,900	17,216,900	2,830,400	147,800	1,075,900	4,054,100	21,271,000
				L'An	L'Anguille River				
5b-2	447,000	100,100	50,000	597,100	169,000	2,500	136,500	248,000	845,100
Subtotal	447,000	100,100	50,000	597,100	109,000	2,500	136,500	248,000	845,100
Total	20,623,000	2,190,800	4,597,400 27,411,200	27,411,200	3,789,200	225,900	2,455,600	6,470,700	33,881,900

1/ Price Base: 1970.

## Appendix table VII-4--Total installation and annual costs St. Francis River Basin, recommended plan, short range (10-15 years)

	•	: Amortization	•	:
	: Total	: of	: and	:
		: Installation	<u> </u>	
Watershed Number	: Cost	: Cost $\frac{1}{}$	: Cost 2/	: Total
		Dolla	ars	
	St. Franc	is River Below	Wappapello Re	servoir
5-7	3,421,100	235,500	18,800	254,300
5–8	581,500	40,000	13,500	53,500
5-11a	479,500	33,000	10,400	43,400
5-13	4,758,400	327,500	20,000	347,500
5-14	644,900	44,400	11,400	55,800
5-26	782,000	53,800	23,000	76,800
5-27	300,700	20,700	17,000	37,700
5-33a	797,700	54,900	8,700	63,600
Subtotal	11,765,800	809,800	122,800	932,600
		Little River	System	
5a-1	4,174,100	287,300	48,000	335,300
5a-5	3,869,000	266,300	20,100	286,400
5a-6	1,938,600	133,400	28,300	161,700
5a-7	2,869,500	197,500	54,200	251,700
5a-8	4,093,200	281,700	64,300	346,000
5a-9	1,276,600	87,900	29,200	117,100
5a-10	3,050,000	209,900	72,000	281,900
Subtotal	21,271,000	1,464,000	316,100	1,780,100
		L'Anguille	River	
5b-2	845,100	58,200	4,800	63,000
Total	33,881,900	2,332,000	443,700	2,775,700

 $<sup>\</sup>underline{1}$ / Price Base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

 $<sup>\</sup>underline{2}$ / Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VII-4a--Total installation and annual costs St. Francis River Basin, recommended plan, short range (10-15 years)

	•	: Amortization	: Operation	•
	: Total	: of	: and	•
	:Installation	: Installation		•
Watershed Number	: Cost	: Cost <u>1</u> /	: Cost 2/	: Total
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Doll	ars	
	St. Franc	is River Below	Wappapello Re	servoir
5 <b>-</b> 7	3,421,100	201,700	18,800	220,500
5-8	581,500	34,300	13,500	47,800
5-11a	479,500	28,300	10,400	38,700
5 <b>-1</b> 3	4,758,400	208,500	20,000	228,500
5-14	644,900	38,000	11,400	49,400
5-26	782,000	46,100	23,000	69,100
5-27	300,700	17,700	17,000	34,700
5 <b>-</b> 33a	797,700	47,000	8,700	55,700
Subtotal	11,765,800	621,600	122,800	744,400
		Little River	System	
5a-1	4,174,100	246,100	48,000	294,100
5a-5	3,869,000	228,100	20,100	248,200
5 <b>a-</b> 6	1,938,600	114,300	28,300	142,600
5 <b>a-</b> 7	2,869,500	169,200	54,200	223,400
5 <b>a-</b> 8	4,093,200	241,300	64,300	305,600
5 <b>a-</b> 9	1,276,600	75,300	29,200	104,500
5 <b>a-1</b> 0	3,050,000	179,800	72,000	251,800
Subtotal	21,271,000	1,254,100	316,100	1,570,200
		L'Anguille	River	
5b-2	845,100	49,800	4,800	54,600
Total	33,881,900	1,925,500	443,700	2,369,200

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

Appendix table VII-5--Estimated average annual damages and benefits 1/St. Francis River Basin, recommended plan, short range (10-15 years)

Watershed	: Irrigated	: Irrigated	. Agri.	Koads & : Bridges :	Deposition	Scour	Subtotal	Indirect	Total	Drainage
			St	St. Francis	River below	Wappapel	River below Wappapello Reservoir	. 1		
				Estima	Estimated average annual damages	annual da	mages $2/$			
					Dollars	-				
5-7	7,900	815,900	51,400	9,700	400	300	882,600	88,300	970,900	
2-8	10,100	51,900	24,400	4,500	1	ı	90,900	9,100	100,000	
5-11a	30,000	97,200	8,400	1,600	ı	ı	137,200	13,700	150,900	
5-13	47,100	552,500	33,400	6,200	4,000	2,100	645,300	64,500	709,800	
5-14	123,000	126,100	12,200	2,300	100	100	263,800	26,400	290,200	
5-26	34,800	428,900	24,200	4,400	ı	ı	492,300	49,200	541,500	
5-27	53,700	429,500	25,900	4,900	1	ı	514,000	51,400	565,400	
5-33a	1	235,900	1	1	1	1	235,900	23,600	259,500	
Total	303,600	2,737,900	179,900	33,600	4,500	2,500	3,262,000	326,200	3,588,200	
				Estimated	average	annual benefits $3/$	nefits $3/$			
5-7	2,700	424,800	37,500	8,400	400	300	474,100	47,400	521,500	286,200
5-8	5,500	. 26,900	19,500	4,000	ı	1	55,900	5,600	61,500	28,700
5-11a	16,600	50,500	6,700	1,400	ı	ı	75,200	7,500	82,700	59,900
5-13	26,400	284,800	25,500	5,200	1,900	1,000	344,800	34,400	379,200	229,500
5-14	000,69	66,500	009,6	2,000	100	100	147,300	14,700	162,000	120,000
5-26	20,000	231,000	19,400	4,000	ı	1	274,400	27,400	301,800	64,800
5-27	30,500	230,000	20,600	4,300	ı	ı	285,400	28,500	313,900	260,000
5 <b>–</b> 33a	1	119,300	1	-	1		119,300	11,900	131,200	83,200
Total	170,700	1,433,800	138,800	29,300	2,400	1,400	1,776,400	177,400	1,953,800	1,132,300

1/ 1974 current normalized prices. 2/ Without additional federal assistance. 3/ With PL-566 assistance.

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Appendix table VII-5 (cont.)--Estimated average annual damages and benefits 1/St. Francis River Basin, recommended plan, short range (10-15 years)

Watershed	: : Irrigated	: Non- Irrigated : Irrigated	Other:	Roads & : Bridges :		: Subtotal : Indirect	Total	Drainage
				Litt	Little River System	tem		
			Esti	mated ave	Estimated average annual damages $\underline{2}/$	damages $\frac{2}{}$		
					Dollars			
5a-1	133,300	494,900	34,600	6,400	669,200	906,99	736,100	
5a-5	14,000	1,141,800	46,800	8,700	1,211,300	121,100	1,332,400	
5a-6	120,400	366,300	26,600	4,700	518,000	51,800	569,800	
5a-7	192,700	930,900	59,800	11,100	1,194,500	119,500	1,314,000	
5a-8	248,700	498,900	44,900	8,200	800,700	80,100	880,800	
5a-9	73,400	220,500	18,700	3,500	316,100	31,600	347,700	
5a-10	102,800	903,100	59,500	11,000	1,076,400	107,600	1,184,000	
Total	885,300	4,556,400	290,900	53,600	5,786,200	578,600	6,364,800	
			Estim	ated ave	Estimated average annual benefits $\overline{3}/$	benefits $\frac{3}{}$		
5a-1	73,200	228,800	25,600	5,300	332,900	33,300	366,200	226,000
5a-5	700	360,400	19,500	4,200	384,800	38,500	423,300	101,500
5a-6	. 66,100	132,600	17,900	3,700	220,300	22,000	242,300	50,200
5a-7	106,300	422,400	47,800	9,900	586,400	58,600	645,000	272,000
5a-8	136,900	261,200	35,900	7,600	441,600	44,200	485,800	113,700
5a-9	40,300	115,000	14,900	3,200	173,400	17,300	190,700	90,100
5 <b>a</b> -10	57,300	483,200	47,600	9,900	598,000	59,800	657,800	342,200
Total	480,800	2,003,600	209,200	43,800	2,737,400	273,700	3,011,100	1,195,700

 $\frac{1}{2}$ / Without additional federal assistance.  $\frac{2}{3}$ / With PL-566 assistance.

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Appendix table VII-5 (cont.)--Estimated average annual damages and benefits 1/St. Francis River Basin, recommended plan, short range (10-15 years)

 $\frac{1}{2}$ / Uithout additional federal assistance.  $\frac{2}{3}$ / With PL-566 assistance.

Appendix table VII-6--Comparison of benefits and costs for structural measures St. Francis River Basin, recommended plan, short range (10-15 years)

						. 1/				
	:	Averag		Annual Bens		s =/	_:		:	D 54.
	:	_		Agricultura	11:		:	Average	:	Benefit
	:	Damage	:	Water	:		:	Annua1	:	To Cost
Watershed	<u>:</u>	Reduction	<u>:</u>	Management	:	Total	:	Cost 2/	:	Ratio
				Doll	ars				-	
			_							
			St	. Francis R	ive	r Below Wa	рра	pello Rese	rvo	<u>ir</u>
5-7		521,500		286,200		807,700		254,300		3.16:1
5-8		61,500		28,700		90,200		53,500		1,68:1
5-11a		82,700		59,900		142,600		43,400		3.28:1
5-13		379,200		229,500		608,700		347,500		1.75:1
5-14		162,000		120,000		282,000		55,800		5.05:1
5-26		301,800		64,800		366,600		76,800		4.77:1
5-27		313,900		260,000		573,900		37,700		15.22:1
5-33a		131,200		83,200		214,400		63,600		3.37:1
J-35a		131,200		63,200		214,400		03,000		J. J/ . I
Subtotal		1,953,800		1,132,300	3	,086,100		932,600		
					Lit	tle River	Sys	tem		
5a-1		366,200		226,000		592,200		335,300		1.76:1
5a-5		423,300		101,500		524,800		286,400		1.83:1
5a-6		242,300		50,200		292,500		161,700		1.80:1
5a-7		645,000		272,000		917,000		251,700		3.64:1
5a-8		485,800		113,700		599,500		346,000		1.73:1
5a-9		190,700		90,100		280,800		117,100		2.39:1
5a-10		657,800		342,200	1	,000,000		281,900		3.54:1
Ja-10		037,000		342,200		,000,000		201,900		3.34.1
Subtotal		3,011,100		1,197,700	4	,206,800		1,780,100		
						*	D.			
					<u>L</u>	'Anguille	KIV	er		
5b-2		97,600		59,900		157,500		63,000		2.50:1
Total		5,062,500		2,387,900	7	,450,400		2,775,700		

<sup>1/ 1974</sup> Current Normalized Prices.

<sup>2/</sup> Average annual cost amortized over a 100-year period at 6-7/8 percent interest.

Appendix table VII-6a--Comparison of benefits and costs for structural measures St. Francis River Basin, recommended plan, short range (10-15 years)

	:_	Averag	e Annual Bene	fits 🖳	:		:	
	:		: Agricultura	1:	:	Average	:	Benefit
	•	Damage	: Water	•	:	Annual	:	To Cost
Watershed	:	Reduction	: Management	: Total	:	Cost 2/	:	Ratio
	-		Dollar	S				
			St. Francis R	iver Below W	appe	apello Rese	TAC	ir
5 <del>-</del> 7		521,500	286,200	807,700		220,500		3.66:1
5-8		61,500	28 <b>,70</b> 0	90,200		47,800		1.89:1
5-11a		82,700	59,900	142,600		38,700		3.68:1
5-13		379,200	229,500	608,700		228,500		2.66:1
5-14		162,000	120,000	282,000		49,400		5.70:1
5-26		301,800	64,800	366,600		69,100		5.31:1
5-27		313,900	260,000	573,900		34,700		16.54:1
5-33a		131,200	83,200	214,400		55,700		3.85:1
Subtotal		1,953,800	1,132,300	3,086,100		744,400		
				J, 000, 100				
			L	ittle River	Syst	<u>cem</u>		
5 <b>a-1</b>		366,200	226,000	592,200		294,100		2.01:1
5a~5		423,300	101,500	524,800		248,200		2.11:1
5a-6		242,300	50,200	292,500		142,600		2.05:1
5a-7		645,000	272,000	917,000		223,400		4.10:1
5a-8		485,800	113,700	599,500		305,600		1.96:1
5 <b>a-</b> 9		190,700	90,100	280,800		104,500		2.69:1
5a-10		657,800	342,200	1,000,000		251,800		3.97:1
Subtotal		3,011,100	1,197,700	4,206,800		1,570,200		
		,	,,-,	.,,		,,,,		
				L'Anguille	Riv	7er		
5b <b>-</b> 2		97,600	59,900	157,500		54,600		2.88:1
Total		5,062,500	2,387,900	7,450,400		2,369,200		

<sup>1/ 1974</sup> Current normalized prices.

<sup>2/</sup> Average annual cost amortized over a 100-year period at 5-7/8 percent interest.

Appendix table VII-7--Estimated average annual damages and benefits  $\underline{1}/$  St. Francis River Basin, recommended plan, long range

Watersheds	: Irrigated	: Non- : Irrigated: Irrigated:	Other Agri.	: Roads & : : Bridges :	: Urban :D	: Overbank : Urban :Deposition:	plain	: Subtotal : Indirect	Indirect	Total	: : Drainage
							Dollars	ars			
						Estimated	l Average	Estimated Average Annual Damages $\overline{2}/$	ges <u>2</u> /		
					St	. Francis F	Niver Belo	St. Francis River Below Wappapello Reservoir	o Reservoir	t.l	
5-9	ı	59,800	4.100	009	ı	009	009	65,700	009,9	72,300	
5-10	ı	323,400	7,200	11,300	2,900	31,700	9,800	386,300	38,600	424,900	
5-11	45,300	293,200	19,900		1	- 1	ı	362,100	36,200	398,300	
5-12	17,600	255,000	15,600	2,900	1	1	1	291,100	29,100	320,200	
5-15	27,100	811,300	58,700		1	1	1	908,100	90,800	998,900	
5-15a	10,800	105,200	18,900		ı	1	ı	138,400	13,800	152,200	
5-15b	41,200	158,500	12,200		1	1	1	214,300	21,400	235,700	
5-16	25,100	394,700	23,100	4,300	1	1	1	447,200	44,700	491,900	
5-17	1	106,300	1	3,100	1	1	1	109,400	10,900	120,300	
5-19	51,300	1,382,000	75,500	14,000	1	1	1	1,522,800	152,300	1,675,100	
5-21	162,500	330,200	25,500		1	1	1	522,900	52,300	575,200	
5-25	17,400	285,000	15,700	2,900	1	1	1	321,000	32,100	353,100	
5-29	18,800	122,800	7,400		ı	1	ı	150,200	15,000	165,200	
5-31	37,800	256,500	15,000	2,700	ı		1	312,000	31,200	343,200	
5-33	51,300	210,900	12,800		1	1	ı	277,400	27,700	305,100	
Tota1	506,200	506,200 5,094,800	311,600	70,700	2,900	32,300	10,400	6,028,900	602,700	602,700 6,631,600	

 $\frac{1}{2}$ / Without additional federal assistance.

Appendix table VII-7 (cont.)--Estimated average annual damages and benefits 1/St. Francis River Basin, recommended plan, long range

Natersheds   Irrigated: Irrigated: Agri, : Bridges : Urban : Deposition: Scour : Subtotal : Indirect : Total : Drainage   Irrigated: Agri, : Bridges : Urban : Deposition: Scour : Subtotal : Indirect : Total : Drainage   Irrigated: Agri, : Bridges : Urban : Deposition: Scour : Subtotal : Indirect : Total : Drainage   Irrigated: Agri, : Bridges : Urban : Betimated Average Annual Benefits 2/  St.	5-74		: Crops an	Crops and Pasture : Non-	Other:	Roads & :	•••••	: Overbank :	Flood- plain				
Estimated Average Muspapello Reservoir  St. Francis River Below Wappapello Reservoir  - 30,300 3,200 600 - 300 30 34,700 3,500 24,500 15,000 15,000 15,000 17,300 17,300 3,500 2,600 - 198,500 15,900 17,300 17,000 2,600 - 198,500 19,900 17,71,000 17,000 17,000 17,000 1,600 - 198,500 19,900 17,71,000 1,600 2,600 - 198,500 19,900 11,600 2,600 - 198,500 19,900 11,600 2,600 - 198,500 11,600 19,800 198,800 12,900 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,800 11,900 11,800 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 11,900 1		Watersheds	: Irrigated		Agri. :	Bridges:	,	eposition:	Scour	: Subtotal :	Indirect	Total	: Drainage
Estimated Average Annual Benefits 2/  St. Francis River Below Wappapello Reservoir  - 180,300 3,200 600 - 300 20,400 6,700 225,000 227,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,500 15,									Doll				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$								Estimated	Average	Annual Benef	its $2/$		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$							St	· Francis R	iver Bel	ow Wappapello	Reservoi	ul	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-9	1	30,300	3,200	009	ı	300	300	34,700	3,500	38,200	26,000
6,200 171,500 17,300 3,500 198,500 19,900 218,400 15,000 15,000 135,900 135,900 12,600 2,600		5-10	1	180,100	6,000	9,300	2.500	20,400	6,700	225,000	22,500	247,500	15,000
9,900 135,900 12,600 2,600 161,000 16,100 177,100 1 1 15,000 421,700 47,100 9,800 493,600 49,400 543,000 55,100 15,100 3,200 493,600 49,400 543,000 52,000 12,500 1 11,800 129,500 125,000 1 1,800 12,500 12,500 1117,700 11,800 129,500 18,500 12,500 96,800 96,800 12,500 12,500 98,600 932,900 185,500 12,500 848,100 84,800 932,900 108,500 175,700 20,400 4,200 848,100 84,800 92,300 12,700 12,700 2,600 179,000 17,900 196,900 10,700 66,000 6,000 1,200 179,000 17,900 196,900 10,700 66,000 12,100 2,500 174,300 17,400 191,700 191,700 29,100 12,100 2,500 174,300 17,400 191,700 191,700 13,8100 13,400 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 2,100 3,391,300 339,400 3,730,700 1,550 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,500 1,5		5-11	6,200	171,500	17,300	3,500	1	ı	ı	198,500	19,900	218,400	142,500
15,000       421,700       47,100       9,800       -       -       493,600       49,400       543,000       5         9,100       55,100       15,100       3,200       -       -       82,500       8,300       90,800         22,600       83,300       9,800       2,000       -       -       117,700       11,800       129,500         14,300       211,300       18,500       3,800       -       -       247,900       24,800       272,700         29,300       18,500       -       -       -       98,600       9,900       108,500       108,500         29,300       175,700       20,400       4,200       -       -       294,800       320,700       10         9,900       153,800       12,700       2,600       -       -       294,800       32,300       17,900       17,900       196,900         10,700       66,000       6,000       1,200       -       -       -       174,300       17,400       191,700         21,600       113,400       10,400       2,100       -       -       -       -       174,300       170,500         29,100       113,400       10,400       <		5-12	006,6	135,900	12,600	2,600	1	1	1	161,000	16,100	177,100	102,000
9,100 55,100 15,100 3,200 82,500 8,300 90,800   22,600 83,300 9,800 2,000 117,700 11,800 129,500   14,300 211,300 18,500 3,800 247,900 24,800 272,700   29,300 745,800 60,500 12,500 848,100 84,800 932,900   175,700 20,400 4,200 291,500 29,200 320,700   9,900 153,800 12,700 2,600 291,500 29,200 320,700   10,700 66,000 6,000 1,200 179,000 17,900 196,900   21,600 138,100 12,100 2,500 174,300 17,400 191,700   29,100 113,400 10,400 2,100 2,500 155,000 3,391,300 3,391,300 3,391,300 1,500   268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 3,391,300 1,500   268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,391,300 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 2,500 20,700 7,000 3,391,300 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 7,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 1,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 1,000 3,391,300 3,730,700 1,500   20,100 113,400 10,400 2,500 2,500 20,700 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,00		5-15	15,000	421,700	47,100	008,6	1	1	ı	493,600	49,400	543,000	211,800
22,600 83,300 9,800 2,000 111,700 11,800 129,500 14,300 211,300 18,500 3,800 247,900 24,800 272,700 29,800 272,700 1,800 - 1,800 1,800 247,900 24,800 272,700 108,500 1,800 98,600 9,900 108,500 108,500 29,200 320,700 17,500 17,500 20,400 4,200 291,500 29,200 320,700 10,700 66,000 12,700 2,600 179,000 17,900 17,900 196,900 10,700 66,000 6,000 1,200 177,000 17,900 196,900 10,700 138,100 12,100 2,500 177,000 17,400 191,700 10,700 10,400 2,100 155,000 155,000 17,500 170,500 170,500 170,500 170,500 170,500 170,500 170,500 170,500 170,500 170,500 170,500 170,400 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700 170,700		5-15a	9,100	55,100	15,100	3,200	ı	1	1	82,500	8,300	90,800	94,400
14,300     211,300     18,500     3,800     -     -     247,900     24,800     272,700       -     96,800     -     1,800     -     -     98,600     9,900     108,500       29,300     745,800     60,500     12,500     -     -     848,100     84,800     932,900       91,200     175,700     20,400     4,200     -     -     291,500     29,200     320,700     1       9,900     153,800     12,700     2,600     -     -     83,900     8,400     92,300       10,700     66,000     6,000     1,200     -     -     83,900     8,400     92,300       21,600     113,400     10,400     2,100     -     -     -     15,500     170,500       29,100     113,400     10,400     2,100     -     -     -     15,500     170,500       268,900     2,778,800     251,700     2,500     20,700     7,000     3,391,300     3,730,700     1,500		5-15b	22,600	83,300	9,800	2,000	ı	1	1	117,700	11,800	129,500	21,500
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-16	14,300	211,300	18,500	3,800	1	1	ı	247,900	24,800	272,700	88,400
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-17	ı	96,800	1	1,800	1	1	ı	009,86	006,6	108,500	70,400
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-19	29,300	745,800	60,500	12,500	1	1	1	848,100	84,800	932,900	426,200
9,900 153,800 12,700 2,600 179,000 17,900 196,900 10,700 66,000 6,000 1,200 83,900 8,400 92,300 21,600 138,100 12,100 2,500 174,300 17,400 191,700 191,700 29,100 113,400 10,400 2,100 155,000 15,500 170,500 268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 339,400 3,730,700 1,5		5-21	91,200	175,700	20,400	4,200	1	ı	1	291,500	29,200	320,700	121,400
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		5-25	006,6	153,800	12,700	2,600	ı	1	1	179,000	17,900	196,900	58,500
21,600 138,100 12,100 2,500 174,300 17,400 191,700 29,100 113,400 10,400 2,100 155,000 15,500 170,500 268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 339,400 3,730,700 1,5		5-29	10,700	000,99	6,000	1,200	1	1	1	83,900	8,400	92,300	49,600
29,100 113,400 10,400 2,100 155,000 15,500 170,500 268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 339,400 3,730,700 1,5		5-31	21,600	138,100	12,100	2,500	1	ı	1	174,300	17,400	191,700	72,700
268,900 2,778,800 251,700 61,700 2,500 20,700 7,000 3,391,300 339,400 3,730,700 1,5		5–33	29,100	113,400	10,400	2,100	1	1	ı	155,000	15,500	170,500	57,000
C 000,CT		Total	268,900	2,778,800	251,700	61,700	2,500	20,700	7,000	3,391,300		3,730,700	1,512,400
													. 000,61

 $<sup>\</sup>frac{1}{2}$ / With PL-566 assistance.  $\frac{2}{3}$ / Incidental recreation.

Appendix table VII-7 (cont.)--Estimated average annual damages and benefits 1/St. Francis River Basin, recommended plan, long range

Drainage			1 1	I	1		238,700 32,100	270,800	1,783,200
Total			851,700 196,800	1,048,500	7,680,100		464,600	573,400	4,304,100
Indirect			77,400	95,300	698,000		42,200 9,900	52,100	391,500
Subtotal		es $\frac{2}{}$	774,300 178,900	953,200	10,400 6,982,100	its $\frac{3}{}$ /	422,400 98,900	521,300	7,000 3,912,600
: Flood-: plain : scour : : ars	er System	nnual damag	1 1	I	10,400	nnual benef	1 1	I	7,000
Overbank : deposition : :	Little River System	Estimated average annual damages $\frac{2}{}$	1 1	. 1	32,300	Estimated average annual benefits $\underline{3}/$	1 1	I	20,700
Urban		Stimate	1 1	1	2,900	Stimate	1 1	1	2,500
Roads & : bridges :		I	7,600	9,400	80,100	Н	6,800	8,400	70,100
Other : agri. :			41,000	50,300	361,900		32,800 7,400	40,200	291,900
Crops and pasture : Non-Irrigated : irrigated :			634,500	795,500	5,890,300		335,700 86,100	421,800	3,200,600
Crops and Irrigated			91,200	98,000	604,200		47,100 3,800	56,900	319,800
Water- shed			5a-11 5a-12	Total	Basin total		5a-11 5a-12	Total	Basin total

Current normalized prices. Without additional federal assistance. With PL-566 assistance. 14121217

Incidental recreation.

4-33992

	•	: Amortization :	Operation	:
	: Total	: of :	and	•
	: Installation			:
Watershed Number	: Cost	: Cost $\frac{1}{}$ :	Cost $\frac{2}{}$	: Total
		Doll	ars	
	St. Fra	ncis River Below	Wappapello :	Reservoir
5-9	273,200	18,800	2,400	21,200
5-10	2,475,800	170,400	9,900	180,300
5-11	1,055,400	72,600	22,300	94,900
5-12	388,100	26,700	13,500	40,200
5-15	2,763,500	190,200	72,100	262,300
5-15a	315,000	21,700	10,500	32,200
5 <b>-15</b> b	932,600	64,200	20,100	84,300
5-16	248,100	17,100	12,700	29,800
5-17	1,226,900	84,400	12,600	97,000
5-19	2,247,200	154,700	101,800	256,500
5-21	1,707,500	117,500	60,300	177,800
5-25	541,500	37,300	20,800	58,100
5-29	797,500	54,900	25,800	80,700
5-31	823,100	56,700	26,600	83,300
5-33	665,400	45,800	12,400	58,200
Subtotal	16,460,800	1,133,000	423,800	1,556,800
		Little River	System	
5a-11	3,247,600	223,500	64,000	287,500
5a-12	333,900	23,000	11,600	34,600
Subtotal	3,581,500	246,500	75,600	322,100
Total	20,042,300	1,379,500	499,400	1,878,900

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 6-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

## Appendix table VII-8a--Total installation and annual costs St. Francis River Basin, recommended plan, long range

	:	: Amortization :	Operation	• •
	: Total	: of :	and	•
	: Installation	: Installation :	Maintenance	A 0
Watershed Number	: Cost	: $Cost \underline{1}$ :	Cost 2/	: Total
		Doll	ars	
	St. Fra	ncis River Below	Wappapello H	Reservoir
-	072 000	3/ 700	0 1.00	30 500
5-9	273,200	16,100	2,400	18,500
5-10	2,475,800	145,900	9,900	155,800
5-11	1,055,400	62,200	22,300	84,500
5-12	388,100	22,900	13,500	36,400
5-15	2,763,500	162,900	72,100	235,000
5-15a	315,000	18,600	10,500	29,100
5 <b>-1</b> 5b	932,600	55,000	20,100	75,100
5-16	248,100	14,600	12,700	27,300
5-17	1,226,900	72,300	12,600	84,900
5-19	2,247,200	132,500	101,800	234,300
5-21	1,707,500	100,700	60,300	161,000
5 <del>-</del> 25	541,500	31,900	20,800	52,700
5-29	797,500	47,000	25,800	72,800
5-31	823,100	48,500	26,600	75,100
5-33	665,400	39,200	12,400	51,600
Subtotal	16,460,800	970,300	423,800	1,394,100
		Little River	System	
5 <b>a-11</b>	3,247,600	191,400	64,000	255,400
5a-12	333,900	19,700	11,600	31,300
Subtotal	3,581,500	211,100	75,600	286,700
Total	20,042,300	1,181,400	499,400	1,680,800

<sup>1/</sup> Price Base: 1970. Installation costs amortized over a 100-year period at 5-7/8 percent interest.

<sup>2/</sup> Long-term prices. Includes replacement cost of measures having less than 100-year life.

	A	Amount Dansel	1/		
-		Annual Benefi Agricultural		 Average	: Benefit
•	Damage	Water	•	: Annual	: to Cost
Watershed:	Reduction :		: Total	: Cost 2/	: Ratio
watersneu.	REGUCTION .	Dollars	· IOCAL	. 0030 _/	- Natio
		DOILars			_
	St. H	rancis River B	elow Wappap	ello Reservo	ir
5-9	38,200	26,000	64,200	21,200	3.02:1
5-10	247,500	15,000 3/	262,500	180,300	1.45:1
5-11	218,400	142,500	360,900	94,900	3.80:1
5-12	177,100	102,000	279,100	40,200	6.94:1
5-15	653,000	211,800	864,800	262,300	3.29:1
5 <b>-</b> 15a	90,800	64,400	155,200	32,200	4.81:1
5-15b	129,500	21,500	151,000	84,300	1.79:1
5-16	272,700	88,400	361,100	29,800	12.11:1
5-17	108,500	70,400	178,900	97,000	1.84:1
5-19	932,900	426,200	1,359,100	256,500	5.29:1
5-21	320,700	121,400	442,100	177,800	2.37:1
5-25	196,900	58,500	255,400	58,100	4.39:1
5-29	92,300	49,600	141,900	80,700	1.75:1
5-31	191,700	72,700	264,400	83,300	3.17:1
5–33	170,500	57,000	227,500	58,200	3.90:1
Subtotal	3,840,700	1,512,400	5,353,100	,1,556,800	
	, ,	15,000 3/	15,000	<u>3</u> / ′ ′	
		Little	River Syst	em	
5a-11	464,600	238,700	703,300	287,500	2.44:1
5a-12	108,800	32,100	140,900	34,600	4.07:1
Subtotal	573,400	270,800	844,200	322,100	
Total	4,414,100	1,798,200	6,212,300	1,878,900	

<sup>1/</sup> 1974 Current Normalized Prices.

<sup>2/</sup> Average annual cost amortized over a 100-year period at 6-7/8 percent interest.

<sup>3/</sup> Incidental recreation.

Appendix table VII-9a--Comparison of benefits and costs for structural measures St. Francis River Basin, recommended plan, long range

•	Averag	e Annual Benefi	the state of the last of the state of the st		:	D 014
•		: Agricultural	•	: Average	:	Benefit
	Damage	: Water	:	: Annual	:	to Cost
Watershed:	Reduction		: Total	: Cost 2/	:	Ratio
-		DC	llars			
	O.L	Doggan Dinga T	)	-11- D		
	St.	Francis River E	Serow Mappap	emo Keservo	olr	
5-9	38,200	26,000	64,200	18,500		3.47:1
5 <b>-1</b> 0	247,500	15,000 3/	262,500	155,800		1.68:1
5 <b>-11</b>	218,400	142,500	360,900	84,500		4.27:1
5 <b>-1</b> 2	177,100	102,000	279,100	36,400		7.67:1
5 <b>-1</b> 5	653,000	211,800	864,800	235,000		3.68:1
5-15a	90,800	64,400	155,200	29,100		5.33:1
5-15b	129,500	21,500	151,000	75,100		2.01:1
5-16	272,700	88,400	361,100	27,300		13.23:1
5 <b>-1</b> 7	108,500	70,400	178,900	84,900		2.10:1
5 <b>-1</b> 9	932,900	426,200	1,359,100	234,300		5.80:1
5 <b>-</b> 21	320,700	121,400	442,100	161,000		2.75:1
5 <del>-</del> 25	196,900	58,500	255,400	52,700		4.85:1
5 <b>-</b> 29	92,300	49,600	141,900	72,800		1.95:1
5 <b>-31</b>	191,700	72,700	264,400	75,100		3.52:1
5 <b>-3</b> 3	170,500	5 <b>7,</b> 000	227,500	51,600		4.41:1
7-33	110,000	77,000				~ ~ ~ <del>~</del> ~
Subtotal	3,840,700	1,512,400	5,353,100	3/1,394,100		
Dabacaar	3,010,100	15,000 3	15.000	3/-,551,200		
		2),000	2),000	_		
		Little	River Syst	em		
5 <b>a-11</b>	464,600	238,700	703,300	255,400		2.75:1
5a-12	108,800	32,100	140,900	31,300		4.50:1
			01.1	-06		
Subtotal	573,400	270,800	844,200	286,700		
m-1-7	1. 1.71. 700	7 700 000	( 030 000	7 (00 000		
Total	4,414,100	1,798,200	6,212,300	1,680,800		

 $<sup>\</sup>underline{1}/$  1974 Current normalized prices.  $\underline{2}/$  Average annual cost amortized over a 100-year period at 5-7/8 percent interest.

<sup>3/</sup> Incidental recreation.

Appendix table VII-10--Present and projected forest land under the baseline projection and the recommended alternative, St. Francis River Basin, year 2000

		Alternative
	Baseline projection	(D) Recommended
Present forest - 1969	985,000	- acres 985,000
Clearing for: Crops Pasture	111,600 100,400 6,200	116,000 104,400 6,200
Urban Floodwater retarding structures Planting	5,000 0 0	5,000 400 6,200
Projected forest - 2000	873,400	875,200
Noncommercial	37,200	37,200
Commercial	836,200	838,000
Wildlife development	65,500	137,000
Recreation development	4,800	10,800
Timber production 1/	831,400	827,200

<sup>1/</sup> Commercial forest minus recreation development.

Appendix table VII-11--Forest management practices under the baseline projection and the recommended alternative, St. Francis River Basin, year 2000

					Alternative	ive
	uit	Quantities needed 1/	Baseline	Baseline projection provides remaining	(D) Recommended	(D) Recommended provides remaining
Forest management plans	acres	000,169	150,000	541,000	178,100	512,900
	acres	13,200	0	13,200	13,200	0
Logging roads and skid trails Grazing removals	acres	78,800	118,300	63,100	112,600 43,800	35,000
Tree planting	acres	51,600	15,700	35,900	22,100	29,500
Timber stand improvement	acres	373,100	95,900	277,200	135,100	238,000

 $\frac{1}{2}$  See table IV-8.  $\frac{2}{2}$  Total acres needing stabilization will vary under the alternative.

Appendix table VII-12--Annual timber growth and product yield under the baseline projection and the recommended alternative, St. Francis River Basin, years 1980, 2000, and 2020

				rnative
	Ba pro	seline Jection <u>l</u> /	Reco	(D) mended 2/
Year	Annual growth	Product 3/ yield	Annual growth	Product 3/ yield
		Cubic fee	et per acre	
1980	<b>36.</b> 8	24.2	36.8	24.2
2000	42.8	36.4	43.8	37.2
2020	49.2	46.7	50.8	48.3

<sup>1/</sup> Current level of management.

Appendix table VII-13--Timber product needs and supply under the baseline projection and the recommended alternative, St. Francis River Basin, year 2000

Plan	Needs 1/	Supply 2/	Unsatisfied needs
Baseline projection	35	· Million cubic fe	et 7
Recommended alternative (D)	35	28	7

<sup>1/</sup> OBERS table IV-2.

<sup>2/</sup> Medium level of management.
3/ Product yield - the growth available for products is a percentage of the net annual growth: 1980 - 70 percent; 2000 - 85 percent; 2020 - 95 percent.

<sup>2/</sup> Includes saw and veneer logs, miscellaneous wood products, pulpwood, and fuelwood.

Appendix table VII-14--Estimated average annual gross erosion and sediment yield from forest land by conditions under the baseline projection and recommended alternative, St. Francis River Basin, year 2000

Forest conditions		Alternative
and problems	Baseline projection	(D) Recommended
Gross erosion	Tons ]	per year
Undisturbed	288,800	307,500
Disturbed 1/ Total	663,900 952,700	430,900 738,400
Sediment yield		
Undisturbed	2,000	2,100
Disturbed 1/ Total	74,100 76,100	45,200 47,300

<sup>1/</sup> Includes logging areas, skid trails, logging roads, fire, and grazing. Treatment of skid trails, logging roads, and grazing expected to be done under the Federal Water Pollution Control Act Amendments of 1972.

Appendix table VII-15--Estimated forest practices cost under the baseline projection and recommended alternative, St. Francis River Basin, year 2000

		Alternative	
Practices	Baseline projection	(D) Recommended	
Tree planting	Million dollars 1/		
Critical	-	5.5	
Inter and other	0.6	0.9	
Timber stand improvement	2.7	3.0	
Grazing exclusion 2/	1.7	4.9	
Logging roads and skid trails 2/	9.7	9.3	
	•		
Technical assistance	0.6	1.2	
Total	15.3	24.6	

<sup>1/</sup> Price Base: 1970. 2/ Treatment under the Federal Water Pollution Control Act Amendments of 1972.

Appendix table VII-16--Additional forest land needed to satisfy timber production needs under the baseline projection and the recommended alternative, St. Francis River Basin, year 2000

Plan	Additional forest land
	Acres
Baseline projection	192,000
Recommended alternative (D)	188,000

Appendix table VII-17--Forest employment and income under the baseline projection and recommended alternative, St. Francis River Basin, year 2000

Forest employment	Unit		Alternative	
		Baseline projection	(D) Recommended	
	treatment practices technical assistance			
a.	Number	man-years	734	924
b.	Income	million dollars	6.4	6.9
ore	st management,			
pro	otection, and dustries			
pro	otection, and	man-years	1,000	1,000
ind	otection, and dustries	man-years million dollars	1,000 6.4	1,000
ind	otection, and dustries Number Income	million	·	
proint a. b.	otection, and dustries Number Income	million	·	

## Definitions

Commercial forest land - Forest land which is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.

<u>Cropland</u> - Land under cultivation within the past 24 months, including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards and land in soil improving crops, but excluding land cultivated in developing improved pasture.

Farm - A place of 10 or more acres from which the sale of agricultural products totaled \$50 or more annually, or a place of less than 10 acres from which the sale of agricultural products totaled \$250 or more during the previous year.

Farm and miscellaneous lands - Privately owned lands other than forest industry.

Forest land - Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use. (Also see Commercial forest land, Noncommercial forest land, Productive-reserved forest land, and Unproductive forest land.) Includes chaparral areas in the West and afforested areas. The minimum area for classification of forest land is lacre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classed as forest if less than 120 feet in width.

Forest types - A classification of forest land based upon the tree species presently forming a plurality of stocking. For poletimber size trees and larger, stocking is determined from basal area occurrence and for trees less than 5.0 inches d.b.h. from numbers of trees.

## Major Eastern Forest Type Groups

Oak-Pine - Forest in which hardwoods (usually upland oaks) comprise a plurality of the stocking but in which southern pines comprise 25-50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Oak-Hickory - Forests in which upland oaks, or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar, elm, maple, and black walnut.)

Oak-Gum-Cypress - Bottom land forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine.

(Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

<u>Elm-Ash-Cottonwood</u> - Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple.)

Growing stock volume - Net volume in cubic feet of live sawtimber and poletimber trees from stump to a minimum 4 inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growing stock trees - Live sawtimber trees, poletimber trees, saplings, and seedlings meeting specified standards of quality or vigor; excludes cull trees.

Growth - See definitions for "Net annual growth."

Hardwoods - Dicotyledonous trees, usually broadleaved and diciduous.

Industrial wood - All commercial roundwood products except fuelwood.

Land area - Census definition: The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area. Forest survey definition: Same as above except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

Logging residues - The unused portions of poletimber and sawtimber trees cut or killed by logging.

Mortality - The volume of sound wood in live sawtimber and poletimber trees dying from natural causes during a specified period.

National forest land - Federal lands which have been designated by Executive order or statute as National forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones title III lands.

Net annual growth - The annual change in volume of sound wood in live sawtimber and poletimber trees resulting from natural causes.

Net volume in board feet - The gross board-foot volume of trees less deductions for rot or other defect affecting use for lumber.

<u>Net volume in cubic feet</u> - Gross volume in cubic feet less deductions for rot.

Noncommercial forest land - Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions, and productive forest land withdrawn from commercial timber use through statute or administrative regulation.

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Nonforest land - Land that has never supported forest and lands formerly forested but now developed for nonforest uses such as crops, improved pasture, residential areas, city parks, improved roads, and adjoining rights-of-way, power-line clearings, and certain areas of water classified by the Bureau of the Census as land. (See definition for land area.) In forest areas unimproved roads, streams, canals, and nonforest strips must be more than 120 feet wide, and clearings in forest areas must be more than 1 acre in size, to qualify as nonforest land.

Nonstocked areas - Commercial forest land less than 10 percent stocked with growing-stock trees.

Other land - Includes areas developed for residential, industrial, or related purposes and all nonforest land not included in any other specified land use class.

Other removals - The net volume of growing-stock trees removed from the inventory by cultural operations, such as timber stand improvements, land clearing, and changes in land use.

Ownership - The property owned by one owner, including all parcels of land in the United States.

<u>Pasture and rangeland</u> - Land which is currently improved for grazing by cultivation, seeding, or irrigation, and natural grasslands that never supported tree growth.

<u>Plant byproducts</u> - Wood materials from primary manufacturing plants (such as slabs, edgings, trimmings, miscuts, sawdust shavings, veneer cores and clippings, and pulp screenings) that are used for some products.

<u>Plant residues</u> - Wood materials from primary manufacturing plants that are not used for any product.

<u>Poletimber stands</u> - Stands at least 10 percent stocked with growing-stock trees, of which half or more of the stocking is sawtimber and/or poletimber trees with poletimber stocking exceeding that of sawtimber. (See definition of Stocking.)

<u>Poletimber trees</u> - Live trees of commercial species at least 5.0 inches in diameter breast height but smaller than sawtimber size, and of good form and vigor.

Productivity class - See definition for site classes.

<u>Productive-reserved forest land</u> - Productive public forest land withdrawn from timber utilization through statute or administrative regulation.

Rotten cull trees - Live trees of commercial species that do not contail a saw log now or prospectively, primarily because of rot (e.g., when rot accounts for more than 50 percent of the total cull volume.)
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Roundwood products - Logs, bolts, or other round sections cut from trees.

Saplings - Live trees of commercial species 1.0 inch to 5.0 inches in diameter at breast height and of good form and vigor.

<u>Sapling-seedling stands</u> - Stands at least 10 percent stocked with growing stock trees of which more than half are saplings and/or seedlings.

Saw log - A log meeting minimum approved log-grade specifications, or, for species for which approved log grades are lacking; at least 8 feet long, with a minimum d.i.b. of 6 inches, and with deduction for defect no greater than two-thirds the gross volume.

Sawtimber stands - Stands at least 10 percent stocked with growingstock trees, with half or more of the total stocking in sawtimber or poletimber trees and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees - Live trees of commercial species containing at least one saw log. Softwoods must be at least 9.0 inches in diameter breast height, except in California, Oregon, Washington, and coastal Alaska where the minimum diameter is 11.0 inches. Hardwoods must be at least 11.0 inches in diameter in all States.

Sawtimber volume - Net volume of the saw log portion of live saw-timber trees in board feet.

<u>Seedlings</u> - Established live trees of commercial species less than 1.0 inch in diameter at breast height and of good form and vigor.

<u>Site classes</u> - A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Softwoods - Coniferous trees, usually evergreen having needle or scalelike leaves.

Stand-size classes - A classification of forest land based on the predominant size of timber present, that is, sawtimber, poletimber, or seedlings and saplings.

State, county, and municipal land - Land owned by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking - A measure of the degree to which forest land is occupied by trees of specified classes in relation to a specified basal area standard for trees 5.0 inches d.b.h. and larger, or numbers of trees per acre for trees less than 5.0 inches; tree classes include (1) all live trees, (2) growing-stock trees, and (3) desirable trees. Classification of forest land and forest types are based on stocking of all live trees. Classification of condition classes is based on stocking of desirable trees.

Timber products - Includes (a) roundwood products such as saw logs, veneer logs and bolts, cooperage logs and bolts, pulpwood, fuelwood, piling, poles, posts, hewn ties, mine timbers, and other round, split, or hewn products, and (b) byproducts of primary wood manufacturing plants.

Timber removals - The net volume of growing stock trees removed from the inventory by harvesting; cultural operations, such as timber-stand improvement; land clearing; or changes in land use.

Unproductive forest land - Forest land incapable of yielding crops of industrial wood because of adverse site conditions. Includes sterile or poorly drained forest land, subalpine forests and steep rocky areas where topographic conditions are likely to prevent management for timber production.



